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April 1978 A Penton/IPC Reinhold Publication

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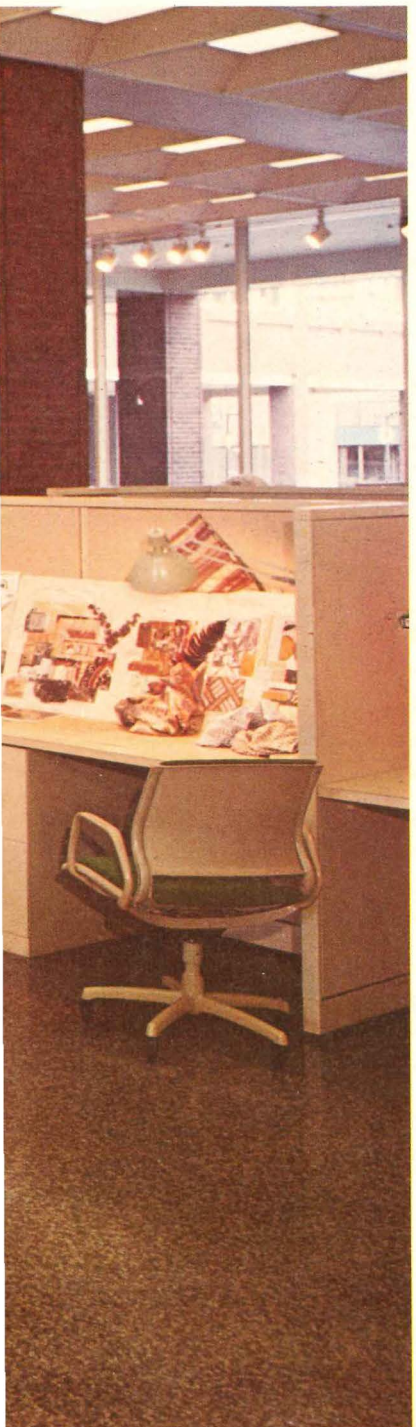

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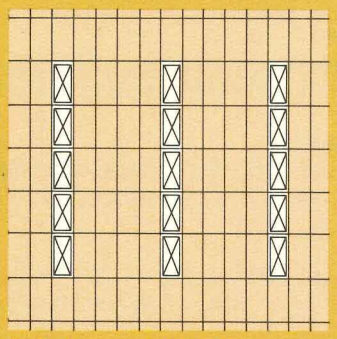
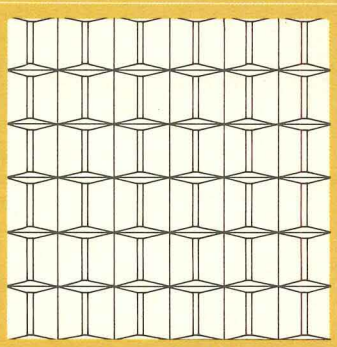
Systems Performance Comparison*



2′x4′ Recessed Troffer



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	classical footcandles	
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95	maintained	70
40	ESI level	44
3.07	watts/sq. ft.	1.84

*30′x30′x9′ room; task—ESI pencil. All test data was supplied by independent laboratories; complete information available on request.

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April 1978

Progressive Architecture

Cover: Checkout counter, main floor, Illinois Regional Library for the Blind and Physically Handicapped and Community Library, Chicago, Il, (p. 76). Designed by Stanley Tigerman. Photo: Philip Turner.

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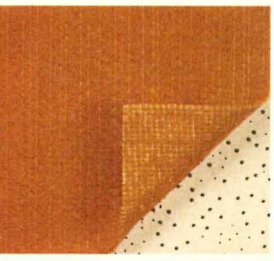
Progressive Architecture is published monthly by Reinhold Publishing Company, Inc., a subsidiary of Penton/IPC. Philip H. Hubbard, Jr., President; Harry I. Martin, Vice-President. Penton/IPC: Thomas L. Dempsey, Chairman; Sal F. Marino, President; N.N. Goodman, Jr., Benjamin L. Hummel, Joseph P. Lipka, Paul Rolnick, Executive Vice-Presidents.

Executive and editorial offices, 600 Summer St., Stamford, Conn. 06904 (203-348-7531).

Subscription information: When filing a change of address, give former as well as new address, zip codes, and include recent address label if possible. Allow two months for change. Subscriptions payable in advance. Publisher reserves right to refuse unqualified subscriptions. Professional rate of $10 per year is available to architectural and architectural-engineering firm personnel and architects, designers, engineers, and draftsmen employed in allied fields. Professionals outside U.S., U.S. possessions, and Canada: $22 per year. Nonprofessional domestic rate: $20 per year. Nonprofessionals outside U.S., U.S. Possessions, and Canada: $35 per year. Single copy $5, payable in advance. Send all orders and payments to Progressive Architecture, P.O. Box 95759, Cleveland, Oh 44101. Send all claims to Progressive Architecture, P.O. Box 6192, Cleveland, Oh 44101.

Indexed in Art Index, Architectural Index, Engineering Index. Publication No. 850700. Second-class postage paid at Cleveland, Oh and additional offices. Volume LIX, No. 4. Printed in U.S.A.



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Accessible and perceivable

April 1978

All of us on the P/A staff have learned a lot during the preparation of this special issue on barrier-free design. Our conception of the subject has been expanded beyond primary concerns about ramps, wheelchair clearance, and door hardware to a consideration of broader design questions, as well.

Those basic physical provisions are properly the subject of code requirements. Since current codes remain exasperatingly ill-defined, however, architects must now collaborate with clients, local authorities, and affected groups to interpret their intent.

The broader design questions, on the other hand, can *never* be covered by strict rules; in these areas, the sensitive understanding of the architect will always be crucial. Beyond simply permitting access, the setting must offer users a sense of comfort, security, and the strongest possible grasp of spatial arrangement and circulation.

The happy irony here is that the architectural qualities we owe to the disabled are essentially no different from what we should provide *all* users. Nobody *needs* narrow corridors, exposure to harsh weather, poorly identified entrances, or cramped restrooms—except a client swayed by short-term economies or an architect preoccupied with form. Where changes in level are considered necessary (sometimes a challengeable assumption), the ramps and/or elevators required by the physically disabled can benefit everyone (particularly maintenance or delivery workers). And surely all users will appreciate buildings that are easy to comprehend and free of hazards such as unexpected steps or curbs and ill-considered projections on furniture.

When we consider the formal, spatial, and symbolic qualities of architecture, some apparent conflicts with prevailing norms emerge. Stairs, for instance, have often been given key symbolic roles. (Interestingly, they are generally used at the entrances to churches, almost never for office buildings, but frequently—at least until recently—at school, library, museum, and residential entrances.) In Modern Architecture, multiple changes of level have often been used to delineate and enliven space. Obviously, such uses should be reconsidered.

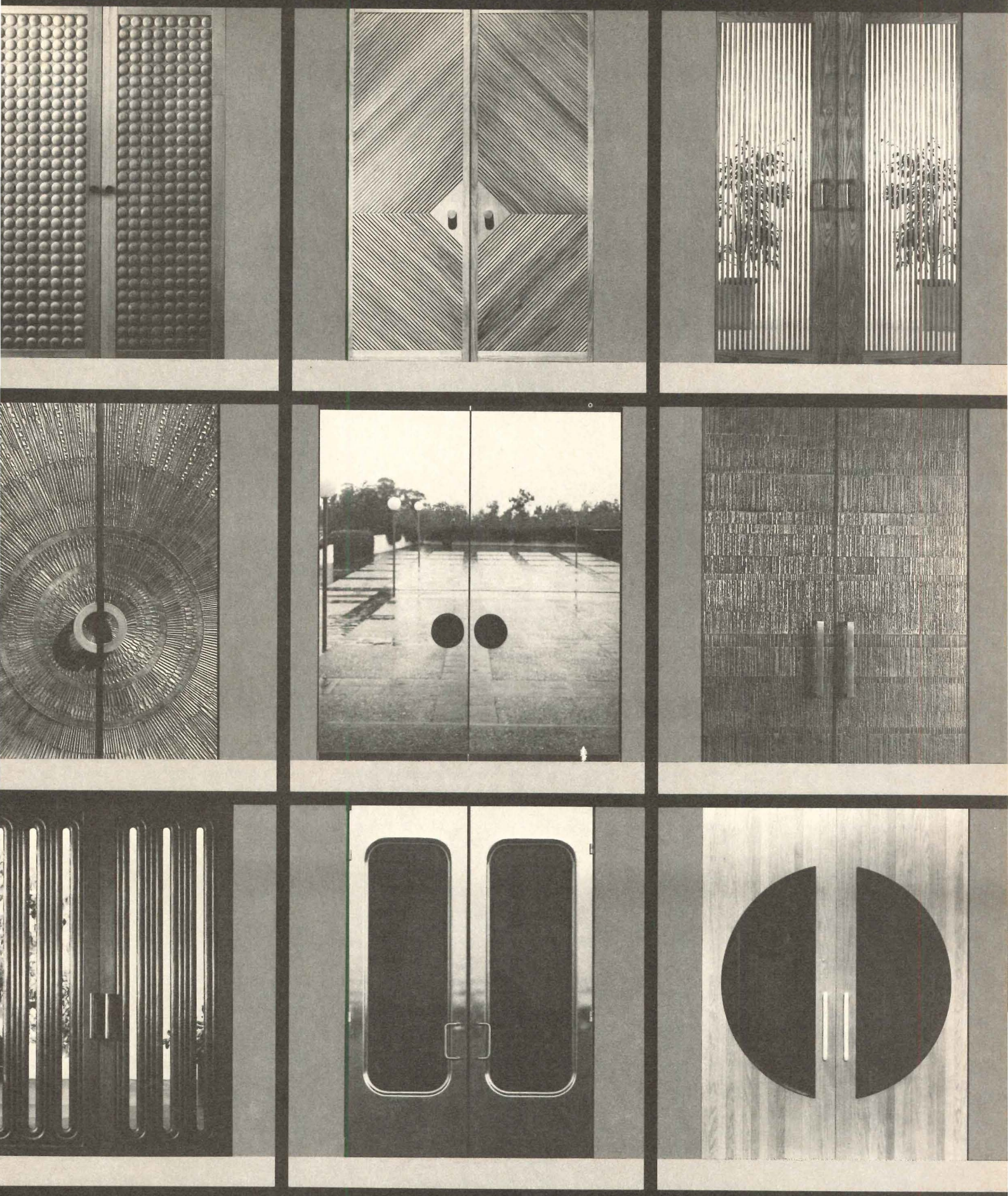
The complexity and ambiguity characteristic of Post-Modern tendencies pose little threat: the kind of visual intricacy advocated by Venturi, Moore, and others offers a richer environment to the sighted, without inconveniencing anyone. The spatial fluidity and ambiguity found in some Modern design can, on the other hand, raise serious problems for the blind or physically disabled.

In considering the use of color, pattern, and light, it turns out to be quite revealing to consider the perceptions of the *partially* sighted—especially since most of us have imperfect vision, declining with age. Design for *imperfect* vision raises questions about the kind of minimal Modern design that minimizes distinctions between walls, floors, and furniture, or the Modern tendency toward uniform light levels (already challenged on energy grounds). Equally questionable in these terms are bold patterns that threaten the visual integrity of major planes or objects in an architectural space.

One of the most basic realizations to come out of our review of writings and buildings for this issue is that the nonvisual characteristics of architecture should ideally *reinforce* the visual. If the kinetic, auditory, thermal—even olfactory—experience is consonant with the formal/spatial concept (and these nonvisual qualities are too rarely considered) the architecture is bound to be more effective—no less so for the majority of us who have "normal" senses and mobility.

In evaluating any work of architecture, it is clearly useful to consider how it would be experienced by users with various disabilities. I know that we will be doing that here at P/A—if not always consciously—and our critical standards will never be quite the same again.

John Morris Dixon



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Views

Skin treatment

In my opinion your presentation on Technics: Exterior Wall Panels in the February issue is exceptionally good. Ordinarily one would hardly expect so much common sense in an architectural publication. You have my honor and respect for your honest and reasonable assessment.

May I say that architecture with heat and dirt absorptive artificial stone and joints made with caulking and sealants will not be good enough in the future.

Henry E. Voegeli
Architect and Engineer
Cheshire, Ct

What is Post-Modern Architecture?

Suzanne Stephens ends her review of my book on Post-Modernism (P/A, Jan. 1978) saying that I "dissemble" and, while she is perfectly welcome to criticize my no-doubt endless shortcomings, she is not invited to call me a liar. I find her label offensive. She cites no example of me falsifying my evidence—a serious, even libelous, charge. Accusing someone of pretense or lying is about as grave a professional and personal accusation as one can make, and since my character is under attack here I would like her to cite line and verse of my duplicity.

She also states that I "churn out architectural history" and implies that I race through books faster than architects can produce history. While it may appear that this is the case because of publishers' schedules (three books appeared in three years)—in fact it is not the way I write them. I worked on *Modern Movements* for five years (three as a Ph.D. under Reyner Banham), *Adhocism* for four, and *The Language of Post-Modern Architecture* for seven (starting with lectures on architecture as a language in 1970). It may be a bore for Suzanne Stephens to check into this sort of thing, but she ought to do it before she indulges in character assassination—especially in this case since she knows me. I had in fact furnished her with a typescript of the second edition ("P/A was able to obtain a draft"—good heavens, I gave it to her in person; it wasn't any clandestine operation or bribe job on P/A's part). She accuses me of shuffling around categories and then writing an average of "1.5 disclaimers" per category—and then never cites one example of this activity. This is criticism by innuendo, McCarthyite journalism.

Anyway, slander aside, what about the confused question of Post-Modern architecture brought up in the review and in your News Report of the same issue. Does it exist, and if so does it have the coherence of previous architectural languages and a set of general principles? My answer is a qualified "yes" to all three of these questions.

Of its existence there can be no doubt. Since roughly 1960 there has been a flood of "anti-modern" buildings just as by 1540 there was a flood of "anti-classical" works. But just as one wouldn't classify all the anti-High-Renaissance ones as Mannerist, so I wouldn't pigeon-hole all the recent departures as Post-Modernist—except in a very loose sense. The recent Harvard conference was quite rightly titled "beyond the Modern Movement" not "Post-Modernism" because the former class is extremely large—including all the worldwide reactions from Ersatz Disneyland to the ecological movement. I would reserve Post-Modernism to a smaller class for reasons which I mention in the 2nd edition. The architects in this group—Venturi, Stern, Moore, Reichlin, Thomas Gordon Smith, sometimes Graves, Scarpa, Tigerman, Takeyama, etc.—were trained as Modernists but have gone counter to it so that their architecture is "doubly-coded," ½ Modern and ½ Post. You can always find at least this dualism in a Post-Modernist whether it is a mixture of Lutyens and Corb, Route 66 and Kahn, Neo-Liberty and industrial style, populism and Mies, self-build and Brutalism, etc. For some unaccountable reason Suzanne Stephens overlooks this definition—unaccountable because it is not only in my new introduction, but I told it to her on the telephone as explicitly and as underlined as I am writing it now. Of course I don't own the definition of the term and there may well be better labels to describe the movement that is happening, but I would stick by it for its descriptive accuracy. Its dualism suggests why Moore's low-income housing is Post-Modern and Hertzberger's Beheer offices and Isozaki's library are Modern (to comment on the Harvard debate you illustrate). The former mixes vernacular codes (shingle style, traditional windows, doors, and spaces) with modern ones (supergraphics, horizontal roof lines, etc.) in a typically schizophrenic way so that the opposition is apparent and meaningful, whereas the latter buildings are coded in a monosemantic way, with homogeneous materials, little historical allusion, and the little bit there is coded for an elite (i.e., "Marilyn Monroe's curves," which are not cued explicitly and probably unrecognizable to the majority of users). So Post-Modernist architecture exists, its language can be recognized as depending on oppositional coding (roughly ½ Modern, ½ other) and we only have to ask if there are some general principles, or theory, which explain and justify the movement.

First, there is the common ground of the Post-Modernists: the area of agreement which many share that holds that Modernism failed. It failed because it was boring aesthetically (Venturi), reductive and against an architecture based on human metaphor (Moore, Graves), anti-social and anti-city (Jacobs, Newman, Krier). This area of negative agreement does not point to a positive consensus—today—but it shows various theoretical directions emerging in common. Maurice Culot's city plans for Brussels have something in common with Krier's drawings and, I would guess, Venturi, Jacobs, Moore, and Newman would all find them preferable to orthodox Modernist redevelopment. Why? Because they refer to the locale, to the history of Brussels, they reinforce rather than disrupt city patterns. Krier might hate these schemes for being pastiche and Venturi might like them for the same reason—but there is a deeper consensus in favor of contextual building, which unites these two opposed Post-Modernists (who have fought often enough in public).

I should underline this disagreement for a moment because it clarifies the debate. Krier, I would guess, classifies himself as a follower of Le Corbusier and the Neo-Classicists; Peter Eisenman has called himself a Post-Functionalist. Both are Modernists in their commitment to an abstract, nonsemantic language which is a "pure" architecture based mostly on syntactic elements (lines, planes, volumes, colonnades, and circuses). They, I'm sure, do not want to be branded as Post-Modernists, and rightly so, because they do not share a majority of the same principles with this movement.

They do not start design from the language of the inhabitants, they are not interested in communicating with their users, they do not doubly code their buildings. On the other hand, Eisenman has evolved a typically Post-Modern space which is ambiguous and humorous, and Krier has practiced contextual design, so they have contributed greatly to Post-Modernism while remaining essentially Modernist.

Do these labels and distinctions matter? They do, I think, for the direction of future architecture and the perception of present building. Clearly there is a place for Modernist buildings and they will go on being built until well after the year 2000, just as good High Renaissance buildings were constructed after 1600. Eisenman will tie his funny, poetic syntactic knots—which have nothing to do with context, history, use, or semantics, which could be doctor's offices or turned upside down, or rotated any which way—and the large offices will produce late Mies, or late Foster, for the next 30 years! Likewise some Renaissance architects carried on their practice with conviction and invention even after theory and practice had swung to Mannerism and Baroque.

I bring up these historical parallels because I think Post-Modernism shares many aspects with Mannerism (a point made by C. Ray Smith in his book on Post-Modern Architecture); it inverts and distorts the previous language while still being an obvious relative, and it adds some heterogeneous elements. In the case of Mannerism, Gothic, Egyptian, and grotesque codes were superimposed, and in the case of Post-Modernism it has been pop, vernacular, and historicist elements that have been juxtaposed to a distorted modernism. In both cases the new movement evolved out of the old because of a basic aesthetic boredom, theoretical dissatisfaction, and practical problems.

There are other reasons for the historical parallel. The word "modern" was first applied [continued on page 12]

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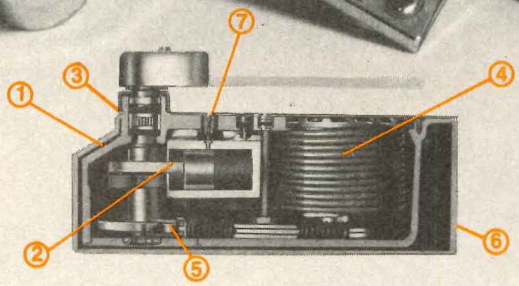

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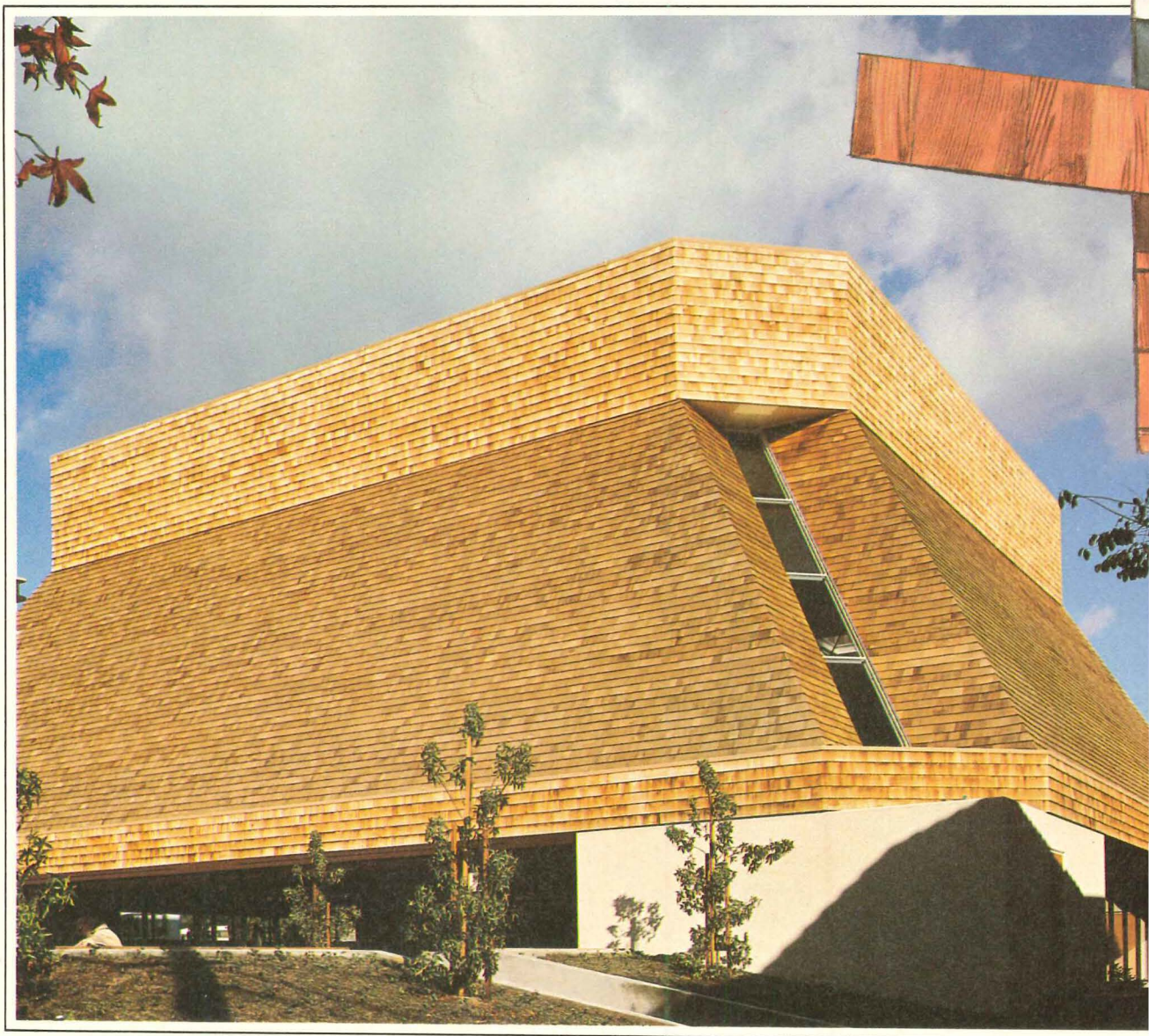

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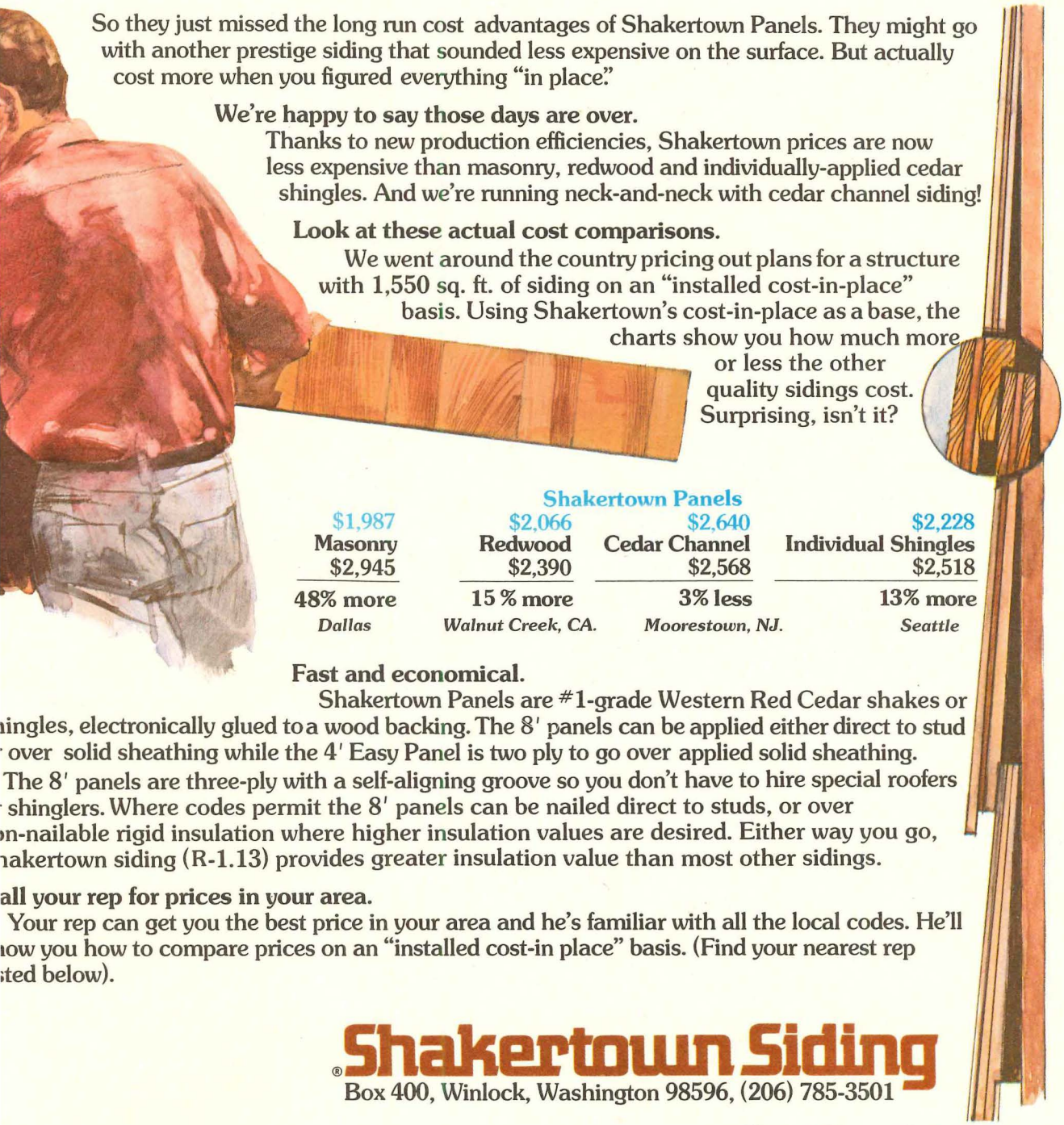

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Views continued from page 8

positively to architecture in about 1460 and used with confusion and inconsistency for the next hundred years. It wasn't until Vasari classified and systematized terms in the 1560s that the word *moderna* enjoyed a consensus of coherent usage (ironically at the height of "Mannerism," which of course wasn't codified until the 1920s). Previously architects and writers were calling all styles "modern" by fits and starts (Greek, Roman, Gothic, and revived Roman), just as today you can't get more than three old architects to agree on what 1920s Modernism was, or three young architects to agree on Post-Modernism. Stylistic and philosophical pluralism is the rule at any one time and it allows a certain freedom and creativity.

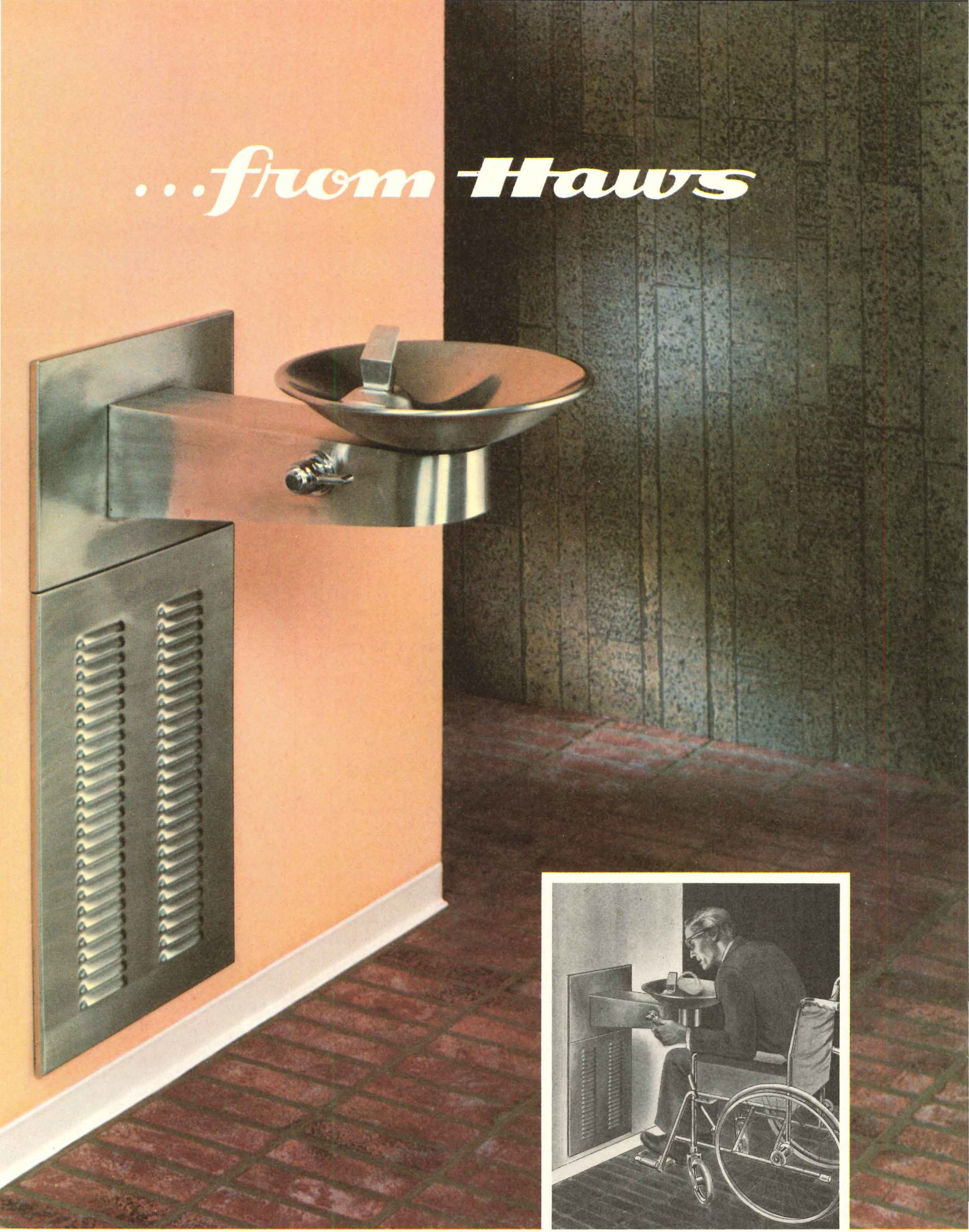
In the case of the word "modern" one can see the point of its power and pluralism. It means being up to date and contemporary, something that everyone wants to be—even those reviving the past, or giving it a "rebirth" as was the Renaissance. Vasari will call himself a modern architect, just as Le Corbusier will, for this reason. On the other hand, today many practicing architects want to dissociate themselves from the Modernist, International Style that has just been, so they can't call themselves "modern" architects without muddying the water. They are led to a term which still partly means "up-to-date," or "contemporary and alive now," but is clearly opposed to 1920s Modernism. It is the duality of this situation which has led to Post-Modernism being accepted as a good descriptive label, as well, incidentally, as a fashionable term of the popular press. For how else to explain the popularity? The term works as the most convenient shorthand to say that there are a lot of architects practicing now (i.e., contemporary) who were brought up as Modernists, but who have gone "Post." The popular press, *Newsweek* and *Vogue,* for instance, will use the term more loosely to mean architecture that is anti-modern, whereas I think we ought to restrict it to a smaller group of buildings which are based on double-coding; but, as with all living and developing labels there is ambiguity and warfare involved. In the long run the term will either be accepted because it usefully describes an era *and* was popular, or it will be forgotten in next year's fashion. The word Mannerism does elucidate certain architecture produced in the 16th Century, but it has taken scholars and the public quite a long time—and series of investigations—to agree on the label.

Charles Jencks
Visiting Professor
University of California, Los Angeles

[According to *Webster's Collegiate,* "dissemble" means "to hide under a false appearance" or "to put on the appearance of." We did not mean to suggest that Jencks is dishonest. Our comments on disclaimers and shuffled categories were somewhat hyperbolic, to make a point; obviously, the statistics on disclaimers was not meant to be taken literally. As for his production of books, we admire his prodigious output—some of which he did not mention above. He did, as he asserts, cooperate fully in keeping us up with revisions in this book, and we appreciate that support.—Editors]

[continued on page 14]

...from Haws



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DRINKING FOUNTAINS

Views continued from page 12

Art Institute's prize room

Initially, I was not concerned with your critical review of the Trading Room ("Out of time, out of place," Nov. 1977) since the room's beauty and magnitude have thrilled scholars and visitors to the Art Institute of Chicago and the room has become one of their prized installations. But colleagues and friends have insisted that the articles by P/A and Donald Hoffmann should not go unanswered.

The real issue to me is not the criticism but the fact that P/A found it necessary to reprint an article written for the daily newspapers not for a professional journal. Furthermore, the facts are that the names of the contractors, craftsmen, architects, and costs were not summarized at the end of the article, as is your usual practice, and that they did not appear in the Annual Index, which leads me to believe that P/A has not taken their role seriously.

However, I would like to comment on Hoffmann's article from the *Kansas City Star*. Hoffmann asked why the room was not rebuilt as a public foyer, if it was to serve as a reception hall. The Trading Room could not function as a lobby for the museum and still be reconstructed accurately with its entrances at one side. If Donald Hoffmann had made himself more familiar with the total project he would have found that the Trading Room was rather sensitively placed within the new wing by Walter Netsch of Skidmore, Owings & Merrill. Netsch placed the room on axis with the original museum designed in 1892 by Shepley, Rutan & Coolidge and with Howard Van Doren Shaw's McKinlock Court (1924). He also accommodated our request that the room not be altered in size, shape, or orientation and that daylight be used to illuminate the skylights. Furthermore, the room was placed near the Columbus Drive entrance in accord with the Walter E. Heller Foundation's wishes that it be easily accessible to the public without an admission charge. Considering these limitations, Netsch's solution is intelligent, and his idea of abstracting such an interior space as the Trading Room in an all white contemporary space is a valid one and worth acknowledging.

It might interest readers to know that although we had salvaged the Trading Room a year earlier for the Art Institute, it was largely at the urging of Walter Netsch that they decided to incorporate the room into the new wing. He, I, and the Art Institute had no idea of the monumental task involved in the reconstruction of a room that had not been seen as it was originally designed since 1908.

As Richard Nickel and I worked day and night through the winter of 1971–72, removing old partitions from the Trading Room, recording its fragments and dismantling them we came to realize the full magnificence of the room. It was amazing to us that the room had largely gone unnoticed. Ironically few people were around to see the Trading Room in its last days, and we felt that only some odd twist of fate would bring it back to life. Those few privileged people who were allowed to view our operation never stayed long in the sub-freezing room or asked questions. Hoffmann's architect friend was most likely one of them. He noted that the room re-

[continued on page 17]

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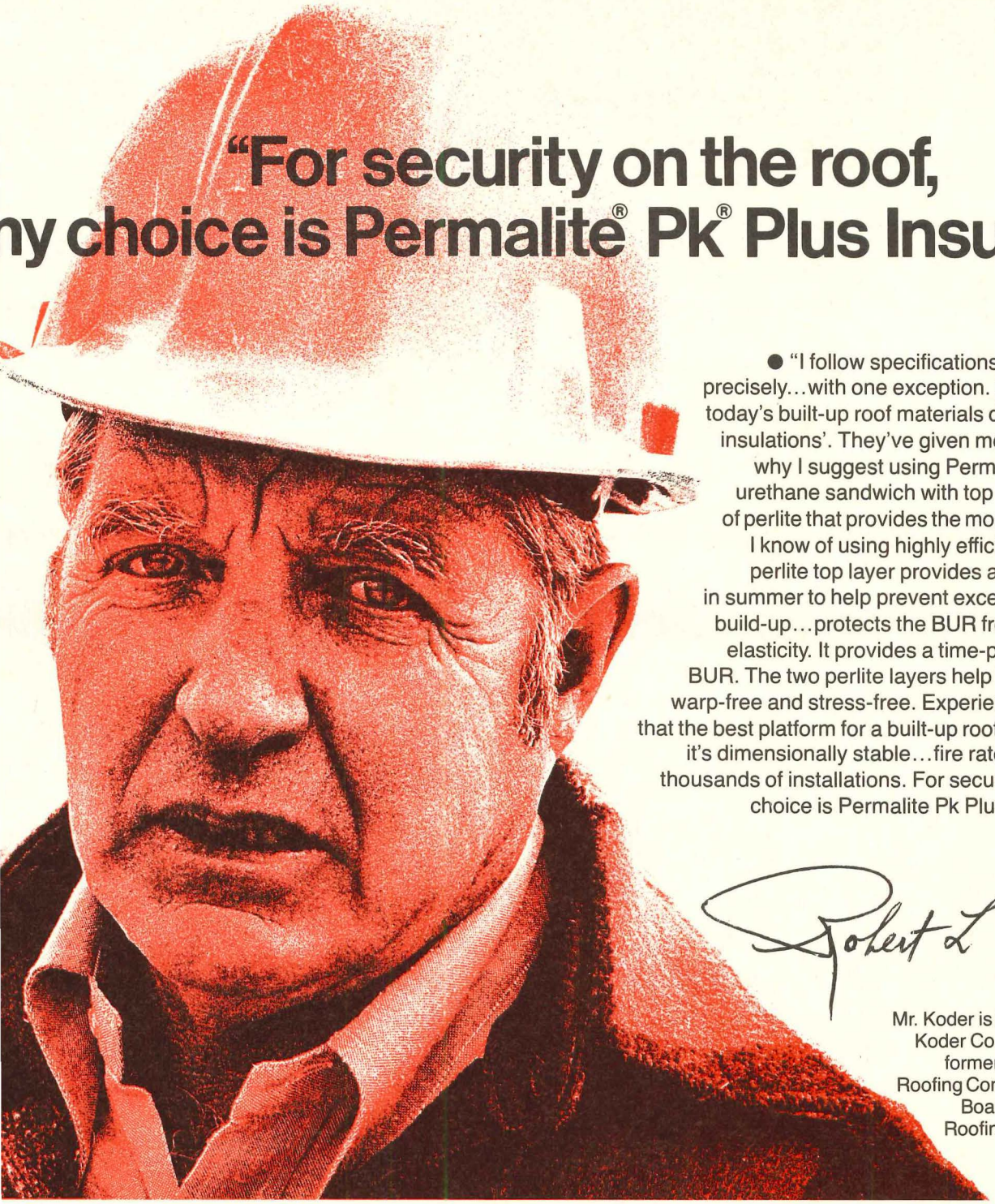

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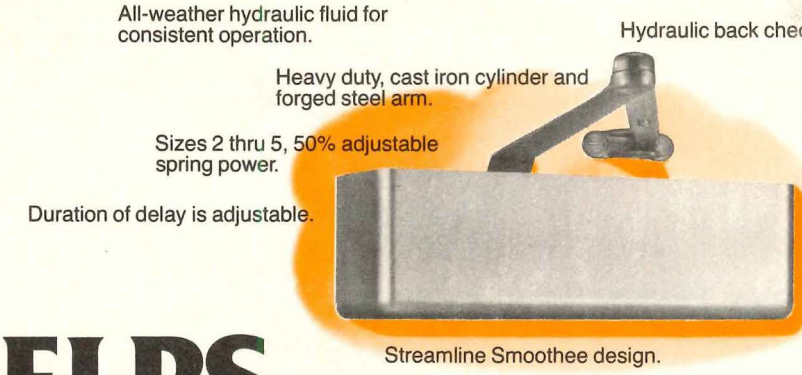

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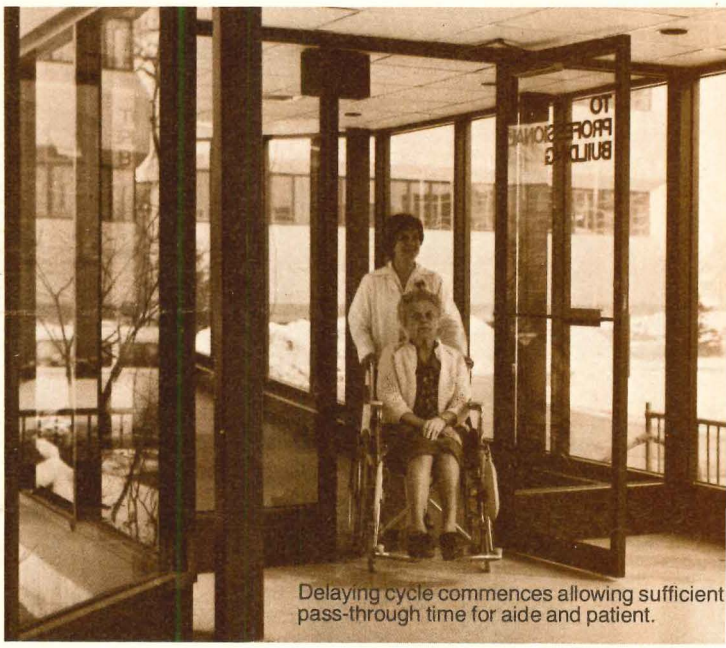
Aide opens door.


Delaying cycle commences allowing sufficient pass-through time for aide and patient.

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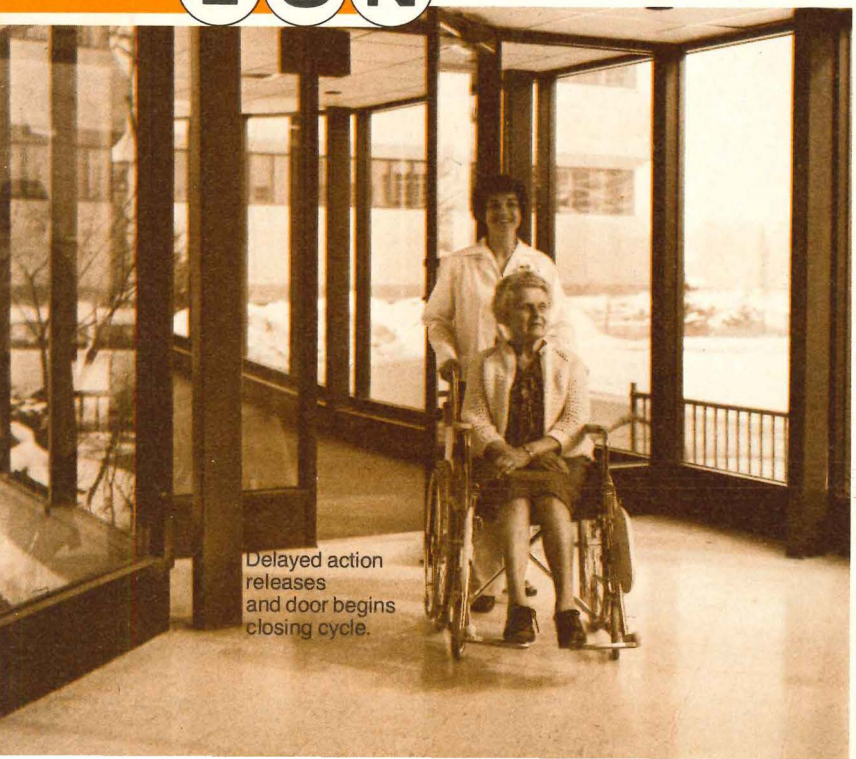
Delayed action releases and door begins closing cycle.

Door closes. General and latching speeds adjustable to suit interior or exterior conditions.

Views continued from page 14

sembles the "playroom" in Frank Lloyd Wright's house, but it seems that a closer relationship exists to the Unity Temple and its community hall in Oak Park. My partner Lawrence Kenny and I had endless discussions on the similarities and differences between Wright and Sullivan. In the case of Unity Temple and the Trading Room, both rooms have four great supports, art glass skylights, side lights, and balconies, and both are entered from the side which is the space's point of focus.

Indeed, this key room should have been restored on LaSalle St. No one would disagree with that, and we all fought for that possibility. But I was appalled when I thought that this seminal room would have gone unnoticed were it not for the Art Institute of Chicago and the Heller Foundation.

I admire Donald Hoffmann and have long been interested in the work of John Root. His important book, *The Architecture of John Wellborn Root,* suffered because of his necessity to defend Root at the expense of Adler & Sullivan. Hoffmann's irritation with Sullivan seems to again permeate his review. Isn't there room for all geniuses in this architecturally starved time?

Sarcasm and wit work well for the morning news for the Babbitts of the Midwest, but can architects and historians be convinced that this lost room is simply a "period room" within a "barnlike" space?

John Vinci
John Vinci/Lawrence Kenny
Architects
Chicago, Ill

[We appreciate John Vinci's thoughtful response. The omission of the customary data block from the article was unfortunate, and the omission from the annual index an oversight. In the article, we carefully credited those responsible. We felt—after more than one of us had seen this room—that Hoffmann's critique was to the point and entirely appropriate for our professional audience, as newspaper criticism sometimes can be. We did feel that it should be supplemented with other basic information, including credits to those who carried out the work, and that was done. The accuracy of restoration, orientation, etc., seems to us negated by other factors, such as the conspicuous changes in outlook and function (which the room no longer has). As the article indicated, we can admire the motives and the means, but not the ends. Others, notably the 1978 AIA Honor Awards jury (see News Report), think otherwise.—Editors]

Correction: brick panels

The Mini-Brick modular panel shown in our Technics article on exterior wall panels (P/A, Feb. 1978, p. 86) was not used on the Riverside City Hall, by architects Ruhnau Evans Ruhnau Associates. Mini-Brick was used on the structure, but not in the form of prefabricated panels. Such panels are suggested by the manufacturer, Pacific Clay Building Products, but are not produced by them. We regret any embarrassment that our misunderstanding may have caused either the manufacturer or the architects. [Editors]

The disabled need not be handicapped... if buildings are properly designed.

Barrier-Free Washfountain

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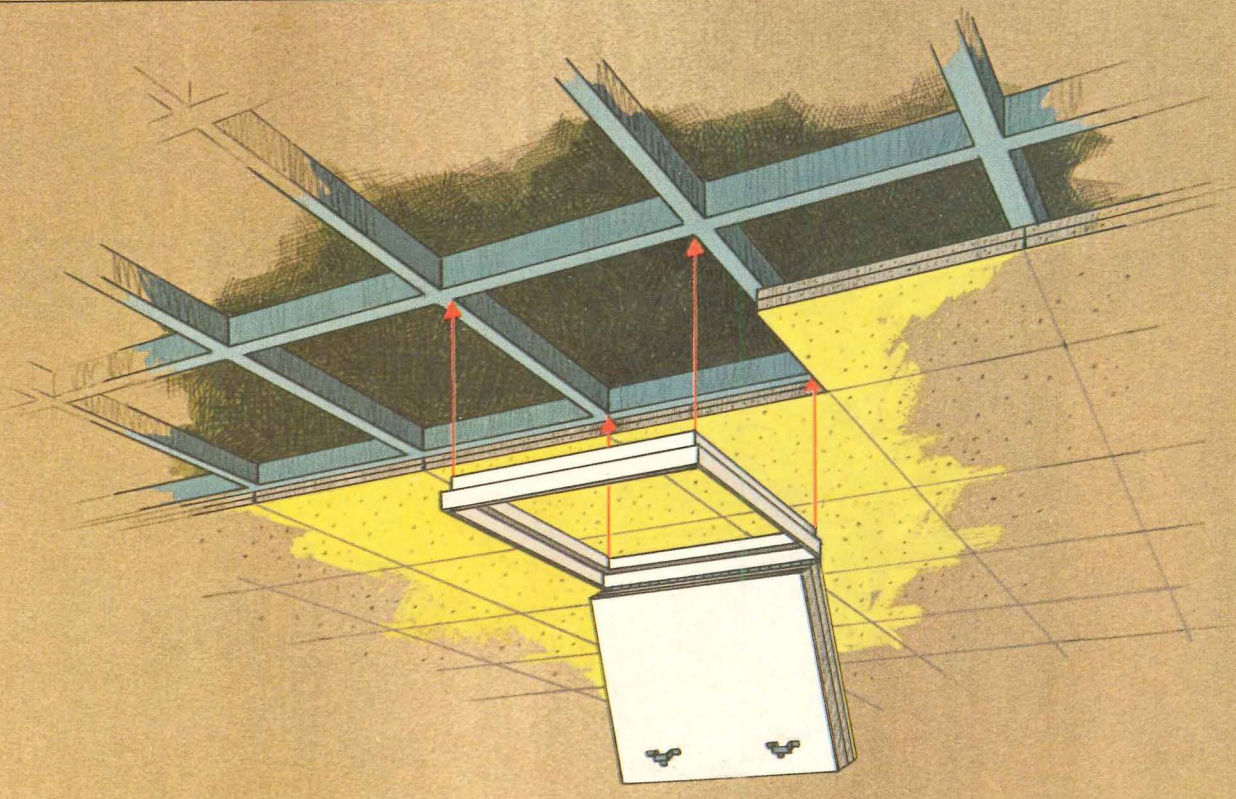

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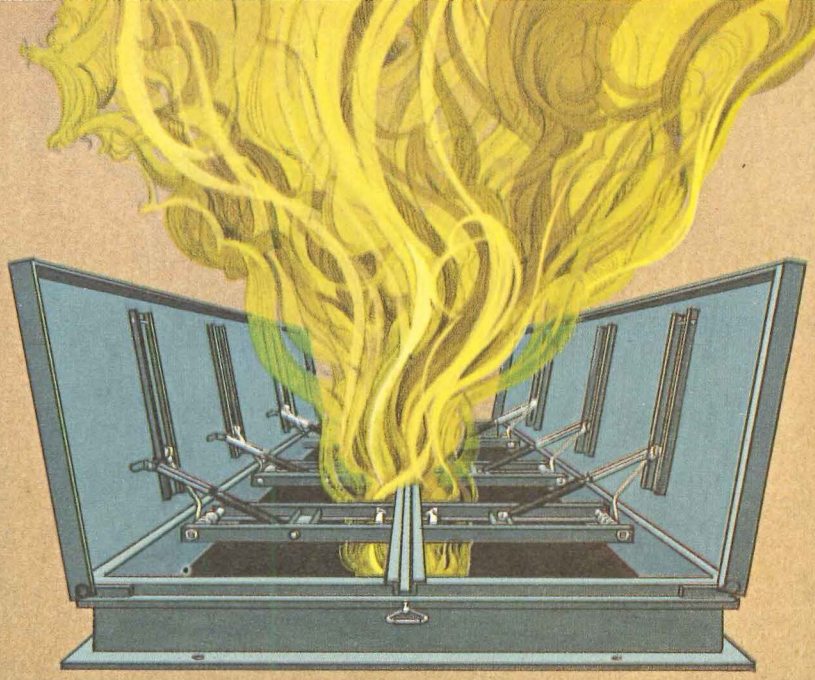
Catalog 33-1 describes this and other styles of Milcor access doors for walls and ceilings. See Sweet's, section 8.12/Inr, or send for your copy.



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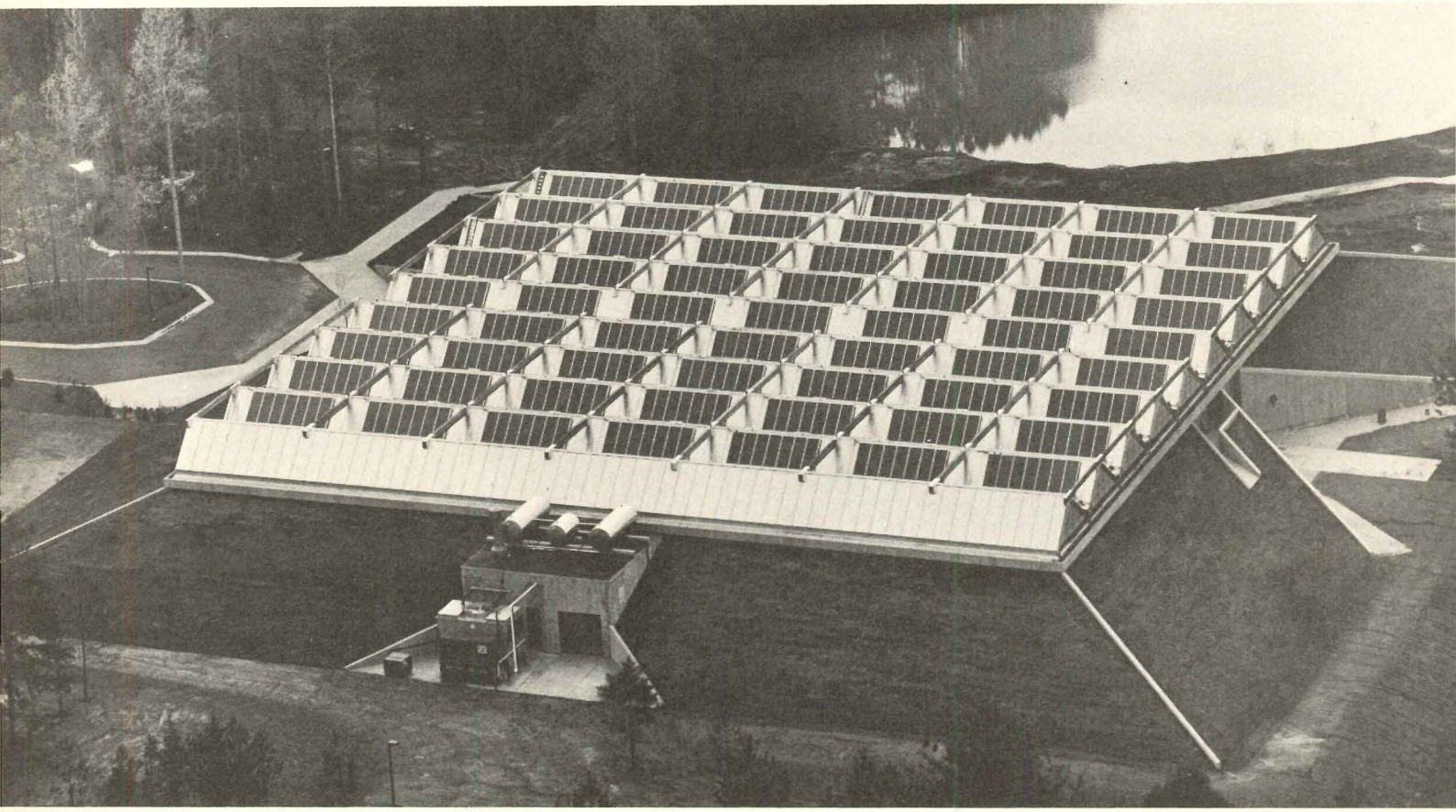
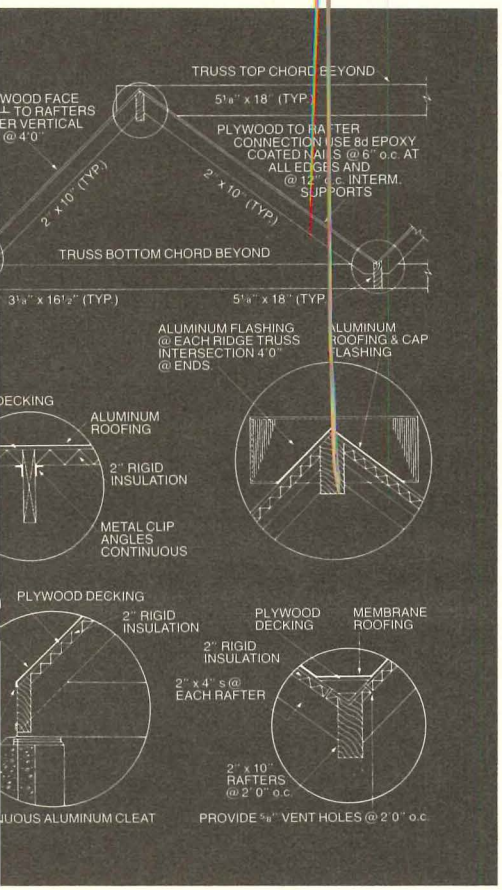
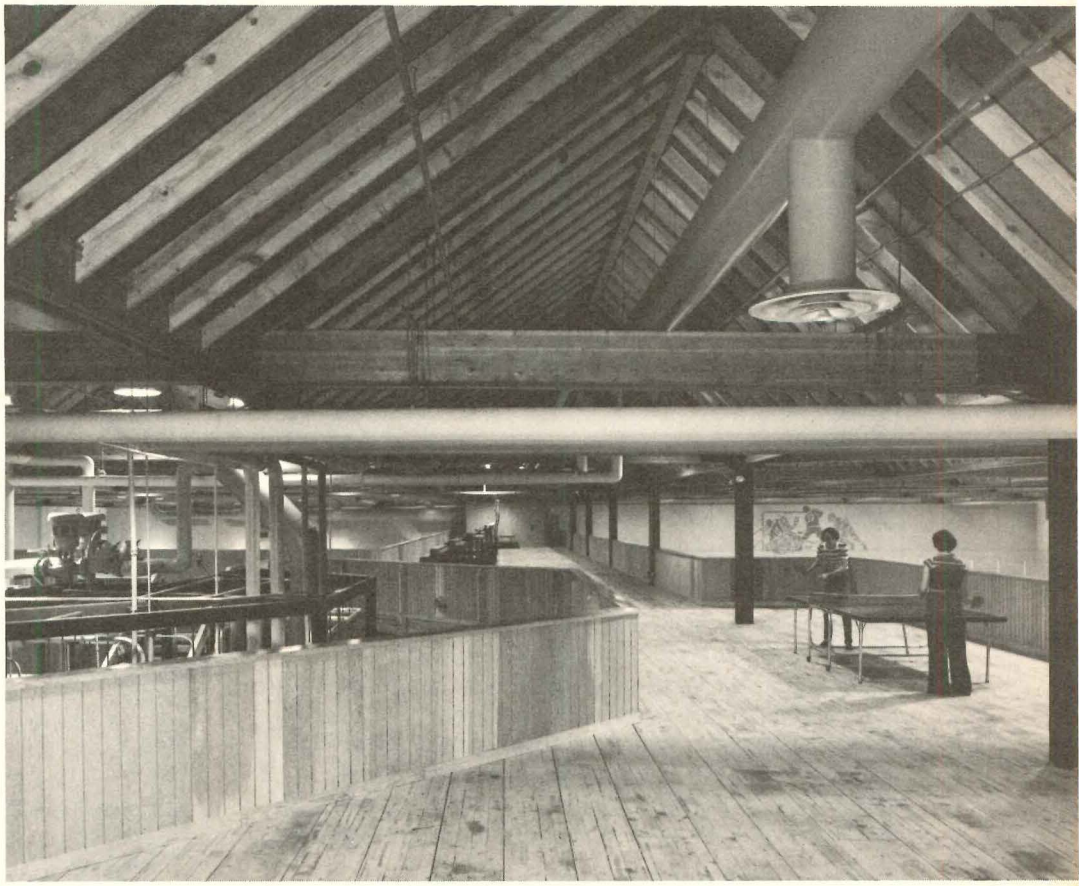


Shenandoah Solar Recreation Center: Shenandoah Development, Inc., owner; Taylor and Collum Architects, Atlanta, Georgia.





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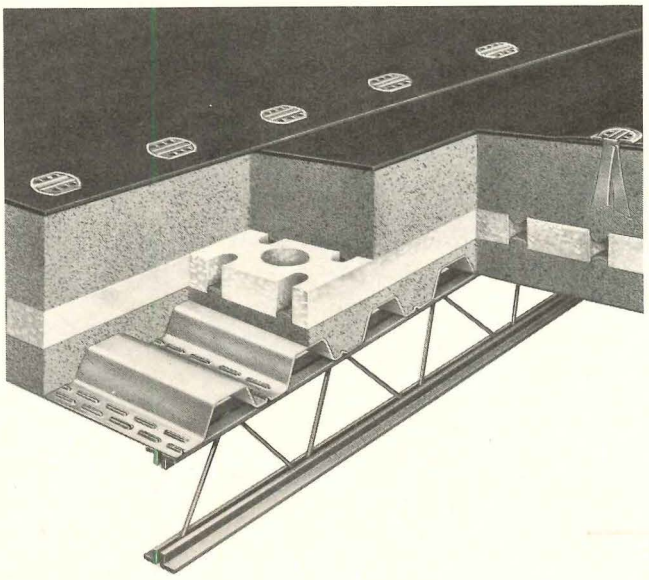

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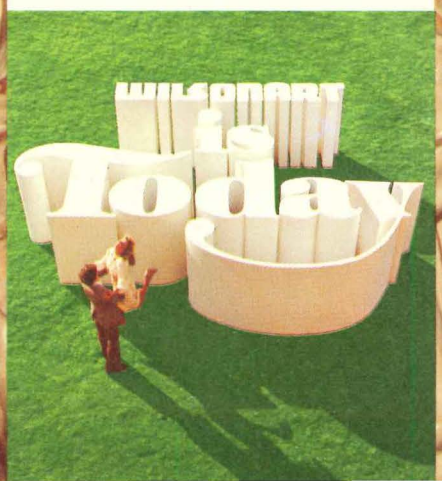

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News report

Transitional deliberations

Legislation has made the intent clear. The handicapped must have access to public-funded programs, buildings, and transportation systems, but the exact nature of a barrier-free environment is now the province of architects—and the courts—to determine. As with many periods of change, the transition is not easy.

What has been called a "landmark" decision was made in 1975 when a judge filed an injunction against the opening of a completely finished major station in the new billion-dollar Metro system of Washington, DC, because the station did not have an elevator, principal means for wheelchair users to reach the trains. The station remained closed several months.

In Springfield, Il, supporters of a barrier-free environment are bitterly complaining about an auditorium in a state building under construction. They are protesting that balcony seats are inaccessible although seats for the handicapped are provided on the main floor; restrooms also are equipped to handle wheelchairs. The building was designed three years ago and complied with the requirements for the handicapped then in effect. "Here's an example of rules being changed as you go along," said Stanley Allan, president of Harry Weese & Associates. He predicts this kind of confrontation will continue until there's a clear reading of the law.

The question of what fulfills the law still is in litigation regarding the Wash-

Lights at platform edge: aid for the disabled in Washington's Metro, by Harry Weese & Associates.

Paul Myatt

Bus with lift: on order for Washington Metro.

Transbus will be required starting 1979.

ington Metro, the most notorious example of tradition vs. the handicapped liberation lobby. Under debate is what did Congress mean by "ready access." A court-appointed committee has been formed to find a solution by April, and one of the members is Richard Heddinger, a mathematics statistician who filed suit in 1972 against the Washington Metropolitan Area Transit Authority to make Metro, then in development and construction, accessible.

Since then, elevators have been installed at every Metro station at a cost of $65 million (less than 2 percent of the $5 billion total projected cost to build Metro, Heddinger figures) but the handicap activists are back in court with complaints that the elevators are so inconveniently located in numerous cases that the effect is a denial of "ready access."

An example Heddinger cites is a trip of several minutes from the Department of Labor, where he works, to a stop at Woodward & Lothrop downtown. For someone who can reach the trains by escalator, the trip involves a saving of six blocks of walking. For the person who must use an elevator (located 600 ft away from the escalator) the trip involves a saving of only two blocks of "walking or pushing a wheelchair." "There are other stations that are worse," Heddinger said, mentioning one in the suburbs where someone having to use the only elevator must drive or be driven an extra three to five miles to reach the elevator side of the station. What is sought, then, are conveniently located elevators—not "one for one," elevator for escalator, as some transportation officials have interpreted the demand.

Cody Pfanstiehl, a spokesman for Metro, believes the continuing pressure for accessibility will result in a backlash. "There's latent public opinion that could undo the good already accomplished," he said. When people realize the public money spent in providing equipment for accessibility for a minority group they are going to protest; he feels a more realistic solution to the transportation question is dial-a-rides.

Heddinger disagrees and supports his position by saying dial-a-ride vehicles would cost taxpayers $20,000 per year while a bus with a lift for wheelchairs would cost $600 per year.

The Washington Metro has ordered 131 such buses plus 20 smaller buses with lifts. St. Louis already has a fleet of 157 and Los Angeles is planning on this kind of bus.

Despite its in-and-out of court history on the barrier-free issue, Washington Metro takes pride in being the most accessible system anywhere to the handicapped. Among its provisions are flashing lights at trackside to alert hard of hearing people that a train is approaching. The trackside pavement also is of a different texture to alert the blind. Uniform handrails help guide the blind to their destinations in the station; operating instructions for elevators are printed in braille; train schedules are available by telephone and station stops are announced for people who can't see; light levels in the stations are being raised to help the partially blind.

Still, official studies show that relatively few handicapped people use the Metro, statistics which seem to justify the reluctance of Metro to make major expenditures for accessibility. However, the rebuttal is that Metro is inconvenient, if not useless, to the handicapped unless its feeder systems, such as buses, also are accessible. Since the Secretary of Transportation ordered a year ago that starting September 1979 all bus purchases must be accessible, ridership figures may be expected to leap.

International Disabled Expo

A display of products for the handicapped, and a seminar, will be held Aug. 10–12 at the O'Hare International Exposition Center, Chicago, sponsored by Paralyzed Veterans of America. A similar event held for the first time last year drew attendance of

Exposition of products for the disabled drew 9000 last year; attendance expected to double this year.

9000. Further information is available from Dennis Quirk, International Disabled Expo, 32 W. Randolph St., Chicago, Il 60601. Exhibits will include prefabricated housing systems.

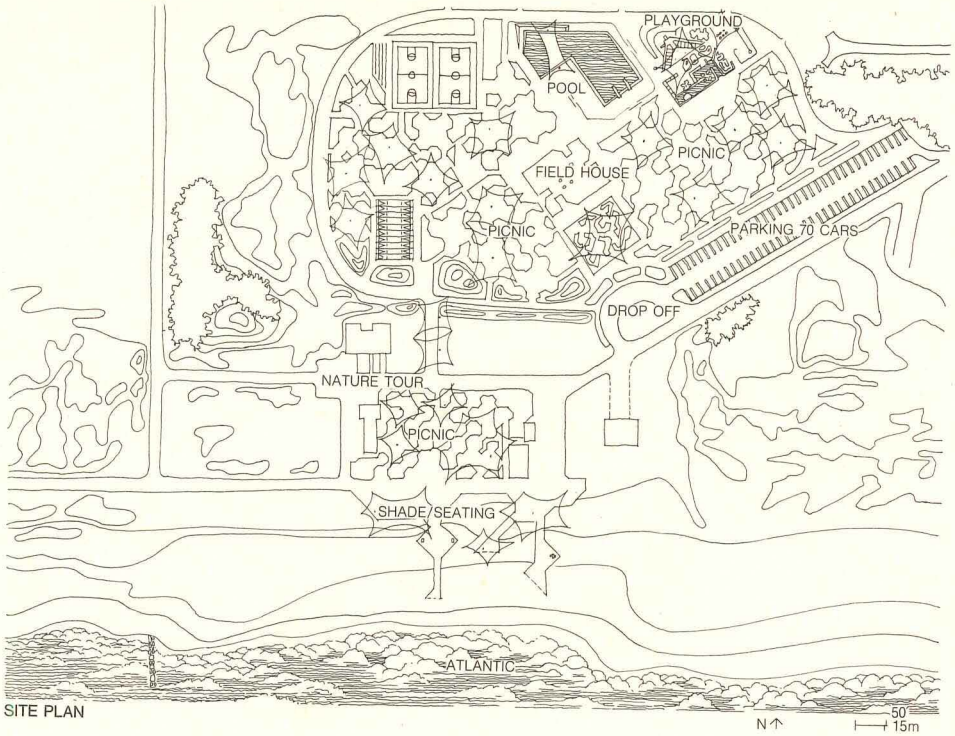
'Gateway' on the Atlantic

"Gateway" is a proposed beachfront park on the Atlantic designed to give new recreational experiences to the disabled in the hopes that, as they become accustomed to handling themselves in these conditions, they will feel more at ease using public beaches elsewhere. The park was designed by architect Arthur Debowy of New York in cooperation with the New York Department of Planning, which is seeking a grant from the National Park Service for a feasibility study. The site is 13.8 acres on the Atlantic near Fort Tilden on Rockaway Point.

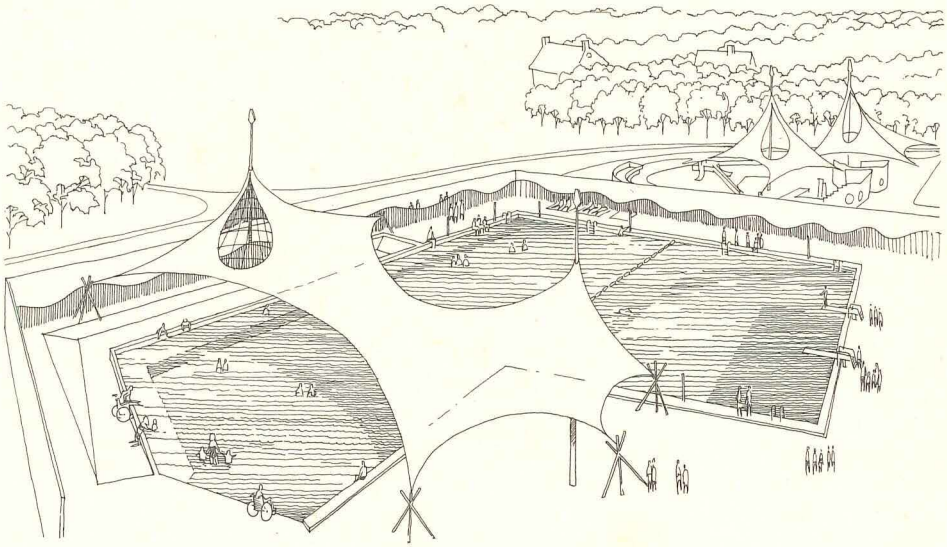
The facility would include four picnic areas, two ball courts, a playground, miniature golf course, pool, and a nature walk. Square-shaped pavilions near the beach would provide seating and shade as a relief from the sun. Clusters of showers would be located at numerous spots around the beach so bathers could cool off quickly—much like the periodic dip in the ocean seasoned sunbathers enjoy. Concrete paths lead from the park proper to the beach for accessibility by wheelchair. Once on the beach wet bar, wheelchairs can be operated with ease on the damp sand.

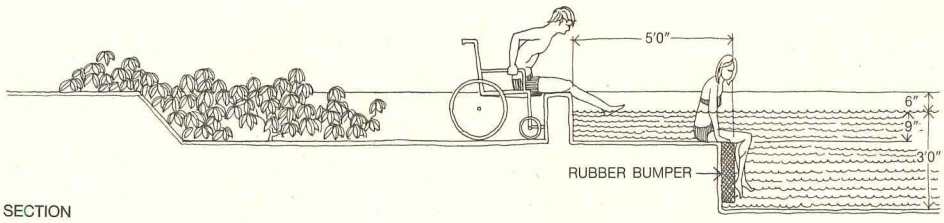
The swimming pool has several innovations. Their buoyancy in the water gives the person with disabled limbs an experience of agility and freedom of motion; the problem is finding a way to enter the water with as little difficulty as possible. Debowy's solution was to provide a slightly raised ledge at the pool's rim and a shelf under the water around a third of the pool so that a person can wheel up to the rim, transfer onto it, and then ease down onto the shelf, which is 5 ft wide. The bather can either remain on the shelf in 9 in. of water or proceed into deeper water. The shelf is expected to appeal also to the elderly, who might prefer to sit in shallow water, and to parents supervising small children at play. The pool also has brass poles at intervals so

[News report continued on page 31]



SITE PLAN





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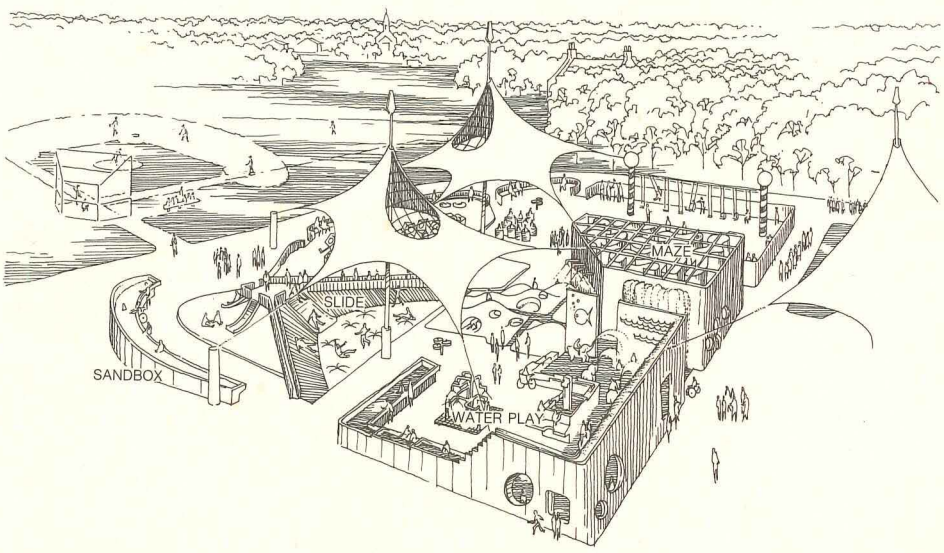

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Featured desk and credenza are from the new Series 3300, Alma's latest contemporary line.
Showrooms: 280 Park Avenue, New York; 1140 Merchandise Mart Plaza, Chicago; Southern Furniture Mart Center, High Point.

News report continued from page 29

swimmers without full use of their legs can pull themselves out.

The picnic areas will have tables with center pedestals so wheelchairs can fit underneath and several types of seating for children and the elderly. Transparent fiberglass wind barriers will make use of the picnic areas more comfortable. Bathhouse facilities will have such items as tilted mirrors and faucets with wrist controls.

Handicapped liberation

The handicapped liberation movement, which began with informal groups after World War II, has achieved several important legislative goals in the areas of job opportunities and accessibility into public buildings. Across the country there are about 200 groups, but five that would qualify as major. Even with victories, they are not lessening the pressure.

"We're striving for as much access as we can achieve," declared Terence Moakley, barrier-free design director of the Eastern Paralyzed Veterans Association, New York. He said while barrier-free laws cover new construction, 90 percent of the buildings in the United States still are inaccessible. Probably the next areas for the handicap lobbyists to tackle are the building code formulas which determine when a building renovation must make provisions for the handicapped.

Milestones in the liberation movement (see p. 63) include the 1973 Rehabilitation Act and its Section 504, which stipulates that programs or activities funded by or dealing with the federal government must be accessible to the handicapped. If buildings in which such programs take place are inaccessible they must be changed. This means that the barrier-free provisions, unlike most legislative change, are retroactive and remedial, a major achievement, the lobbyists feel.

The 1977 White House Conference on the Handicapped, attended by 50 state caucuses, is another landmark event which will have long-term impact when the formal recommendations are released.

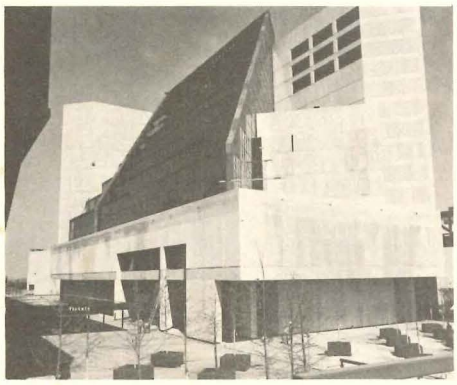
The 1977 Department of Transportation mandate, issued in face of strong opposition by transit systems and vehicle manufacturers, sets Sept. 30, 1979, as the date when new buses purchased with federal subsidies must be the "transbus," a recently developed vehicle with a low floor and a ramp to accept wheelchairs.

The Department of Health, Education, and Welfare in 1977 issued its regulations on how to implement Section 504 only after numerous wheelchair sit-ins at HEW offices across the country. Far-reaching is the requirement that institutions of higher learning, receiving federal aid, must accomplish the necessary structural changes by June 3, 1980.

Is the handicap lib movement militant? No. Persistent, yes. One spokesman said they still have a long way to go. "We're not looking for freebies," explained Terence Moakley. The movement's main argument is that as citizens and taxpayers they are entitled to equal opportunity. When asked about tax breaks for disabilities and half-fares on transportation, Moakley said he's against it and that his organization, the Paralyzed Veterans Association, at congressional hearings has tesitfied against a bill seeking air travel half-fares for the aged and the handicapped.

Of all the groups, the American Coalition of Citizens with Disabilities, comprising a dozen groups, has gained a reputation as the most outspoken and aggressive. One of its prominent representatives, Richard Heddinger, speaks figures, not sentiment, when arguing for the cause. Heddinger is a mathematician with the Bureau of Labor Statistics and was one of the parties suing Metro in Washington, DC, to make it accessible. He says much of the high costs attributed to barrier-free design and equipment are exaggerations, by 3:1.

One of the most difficult barriers to overcome is not a physical one but a myth. Many people believe that handicapped people are cared for by the government, Moakley said, adding that this is not the case. Government aid primarily consists of services, such as health care, plus in some instances a monthly "supplemental security income" of about $200. When an individual earns an income, all of these subsidies are discontinued, and often the person's earned income could not begin to pay for his or her health care. Here, Moakley said, is how disincentives to work are compounded with the other hurdles of hiring discrimination and inaccessibility.



Alexandre Georges

Omni on the auction block?

Omni's success vs. bankruptcy

Emerging from the recession, during which it languished, Omni International in Atlanta (P/A, May 1976, p. 58) now reports a booming business: positive leasing figures and the most popular hotel—in a city which recently has opened several. Yet its senior money lenders led by Morgan Guaranty have filed notice for a sale of the Omni at auction. Cited are due debts of $76.8 million plus $14 million in interest payments. Omni International president Stephen Brown disclaims bankruptcy as the issue and calls the action "more a disagreement among the people doing the financing." Negotiations over the complex proceeded on a day-to-day basis, and the March 7 auction date came and went with a postponement while deliberations continued.

Brown said that occupancy rates are 80 percent for retail, 70 percent for office, and 90 percent for the hotel. Omni developers reportedly are bitter that the mortgagors waited until the complex started doing well before calling in the debt.

John Morris, a vice president of Morgan Guaranty, said that negotiations among the lenders does not alter the fact that the Omni will have a new owner should it be auctioned. Senior lenders would take the first $90.8 million of the sale, and should the Omni be sold for less than that, the junior lenders would receive nothing. Morris

[News report continued on page 32]

News report continued from page 31

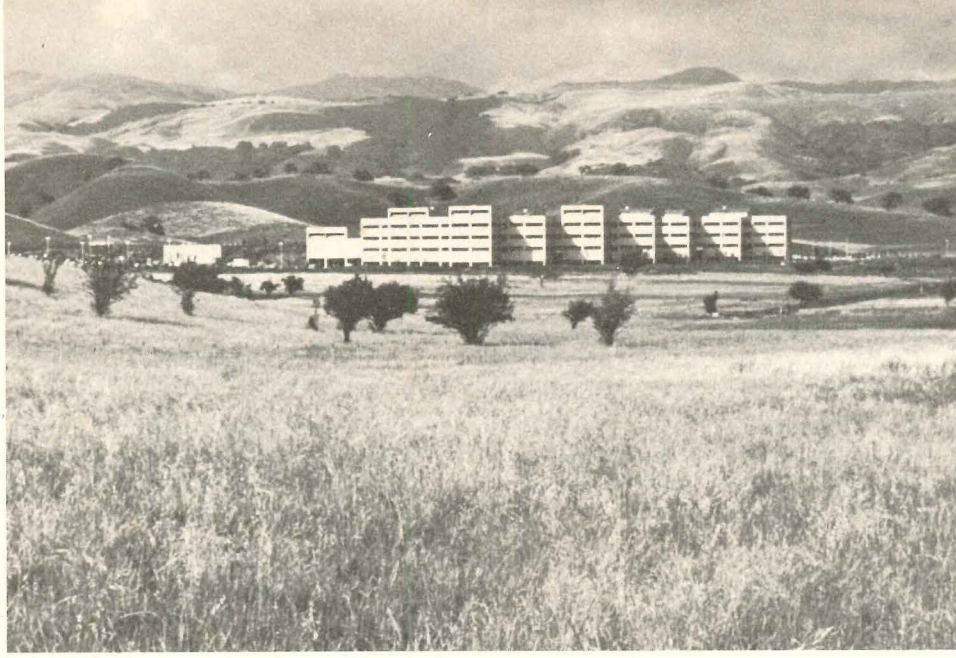
had no comment on why at this particular time, when the Omni is apparently doing well, the banks decided to foreclose.

While Omni undergoes this economic dispute, the Colony Square complex in Atlanta (P/A, May 1976, p. 23) has completed its first year since a court settlement following bankruptcy proceedings gave control to Prudential Insurance Co. of America. Prudential hired the real estate firm of Carter & Associates to manage the multi-use complex and authorized spending $5 million on major interior alterations. Carter general manager Paul Speicher reports a "rebound" in activity at the Square and growing occupancy rates. Part of the hotel was converted into a conference center with appreciable success. Speicher blames the ill fortunes of both Colony Square and the Omni in part on their "premature locations" outside the central business district. He said architect/developer John Portman, who pioneered the urban megastructure in modern times with Peachtree Center, also started his development beyond the CBD but that Portman's was "phased properly" and therefore suffered no major economic setbacks.

AIA cites 15 for honor awards

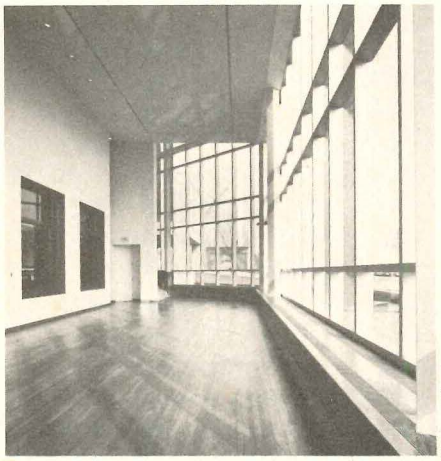
The 1978 Honor Awards presented by the American Institute of Architects will go to seven new buildings and to eight buildings in the extended use category.

The new projects are the Sixty-01 Apartments, Redmond, Wa, by Bissell/August Associates; the house of architect Chester Bowles, Jr. in Geyserville, Ca, by Bowles; an art, drama, music complex, Columbia Basin Community College, Pasco, Wa, by Brooks-Hensley-Creager Architects; the IBM Santa Teresa Laboratory, San Jose, Ca, by MBT Associates; the Yale Center for British Art, New Haven, Ct (P/A, May 1977, p. 21), designed by Louis Kahn, completed after his death by Pellecchia & Meyers, Architects; the addition to the Art Institute of Chicago (P/A, Mar. 1975, p. 33; Nov. 1977, p. 62) by



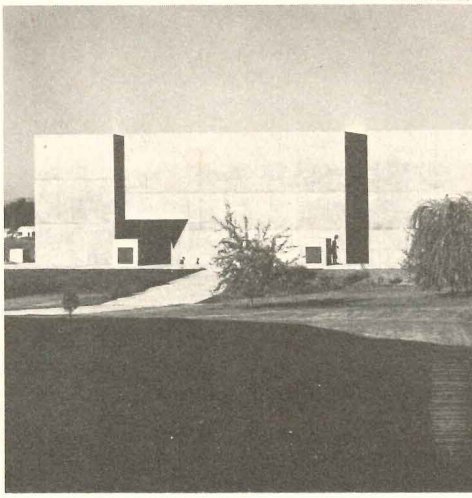
IBM Laboratory

G.E. Kidde



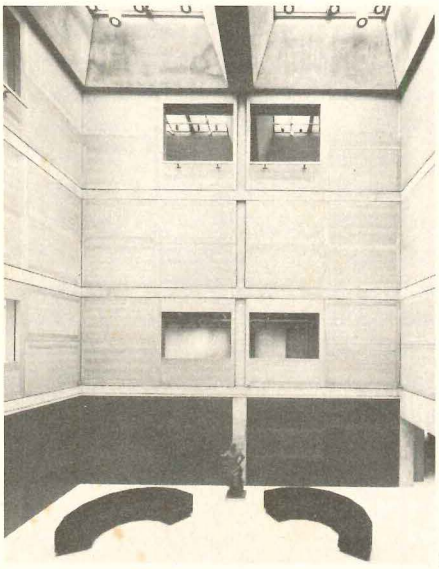
Howard Kaplan

Art Institute of Chicago



Art-drama-music complex

John Ze

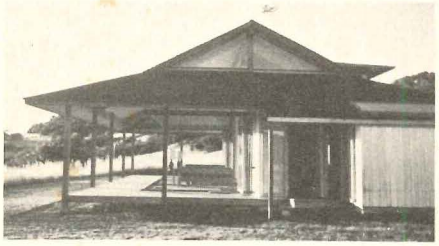


Tom Brown

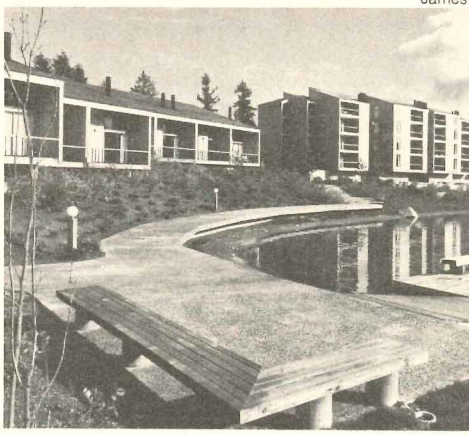
Yale Center for British Art
Chester Bowles residence

Three H Services Center
Sixty-01 Apartments

James

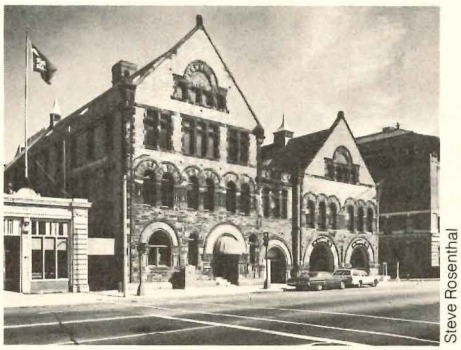


Chester Bowles Jr.



Bill Maris

East Hampton, NY, residence



Steve Rosenthal

Institute of Contemporary Art

Steve Rosenthal

Faneuil Hall Marketplace

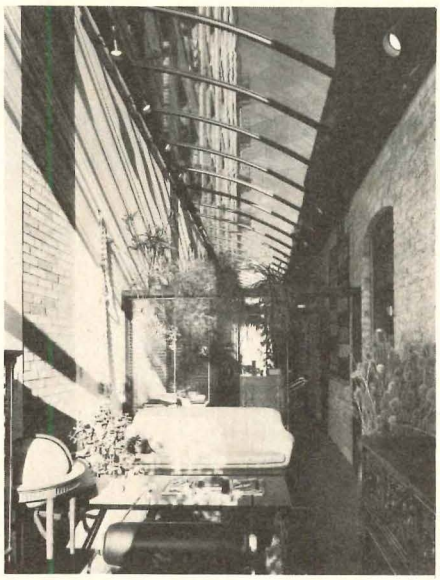
Richard Anderson

Center Stage

Robert Lautman

Robert Elliott house
Cooper-Hewitt Museum

Norman McGrath



Patrick King

Kearns/Daynes/Alley annex

Norman McGrath

Turtle Bay Towers

Skidmore, Owings & Merrill; and the Three H Services Center, Houston, (P/A, May 1976, p. 43) by architect John Zemanek.

Extended use award recipients are an East Hampton, NY, house by Howard Barnstone, Morey & Hollenbeck, and William Chafee; the Kearns/Daynes/Alley annex, Salt Lake City, Ut, by Boyd Blackner; Center Stage, Baltimore, Md, by James Grieves Associates; the Institute of Comtemporary Art, Boston, (P/A, Nov. 1976, p. 54) by Graham Gund Associates; the Cooper-Hewitt Museum, New York (P/A, Dec. 1976, p. 32), by Hardy Holzman Pfeiffer Associates; the Robert Elliott House, Chevy Chase, Md, by Hugh Jacobsen; Turtle Bay towers, New York, (P/A, Nov. 1977, p. 69) by Bernard Rothzeid & Partners; and Faneuil Hall Marketplace, Boston, (P/A, Oct. 1976, p. 35) by Benjamin Thompson & Associates.

The honor awards jury was chaired by William Muchow of Denver and included Fred Bassetti of Seattle, Herbert Duncan Jr. of Kansas City, Joseph Esherick of San Francisco, Robert McAnulty of Charlottesville, Va, Patrick Quinn of Troy, NY, and William Warner of Exeter, RI.

The jury for extended use was chaired by George Notter of Boston; its members were William Comer of New York, Donn Emmons of San Francisco, A. Quincy Jones and Charles Moore of Los Angeles and Terry Morton of Washington, DC.

Eames House: AIA 25-year award

The Charles and Ray Eames home in Pacific Palisades, Ca, has won the Twenty-five Year Award from the American Institute of Architects. The award will be presented to the Eameses during the Institute's national convention in Dallas, May 21–24. The award recognizes an architectural design that has withstood time and proved its enduring significance.

The residence, built in 1949 and sponsored by *Arts and Architecture* magazine as a study house, was one of the first residential applications of prefabricated steel framing and components. The façade is a series of solid, opaque, and translucent planes. "It is interesting," Charles Eames has

[News report continued on page 36]

Charles and Ray Eames residence.

Bold cantilevered design calls for great structural strength...

high-strength steel trusses provide the solution

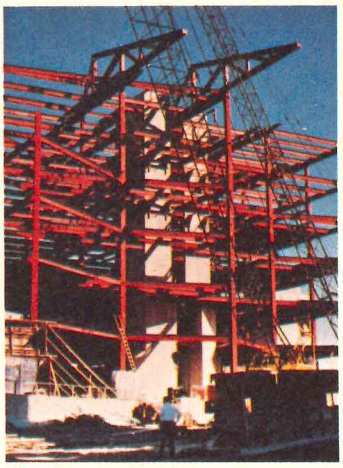
The owner of First Federal Plaza in downtown Austin, Texas, wanted a distinctive design that would focus on a park-like plaza in front of the building's main entrance.

The architects, 3D/Brooks Barr Graeber White, achieved the desired effect with a unique diamond-shaped structure featuring five stepped cantilevered levels. The apex of the cantilevered levels in front of the six-story building provides a focal point to the entry.

Only steel could carry the load

According to the structural engineers, W. Clark Craig & Associates, "The large cantilevers carrying the 72- and 90-ft-long walls required by the architect could only be framed in steel."

Competitive framing materials would have required prohibitively deep sections to carry the cantilevered loads, which would have detracted from the building's esthetics. In addition, steel proved to be more economical and faster to erect.

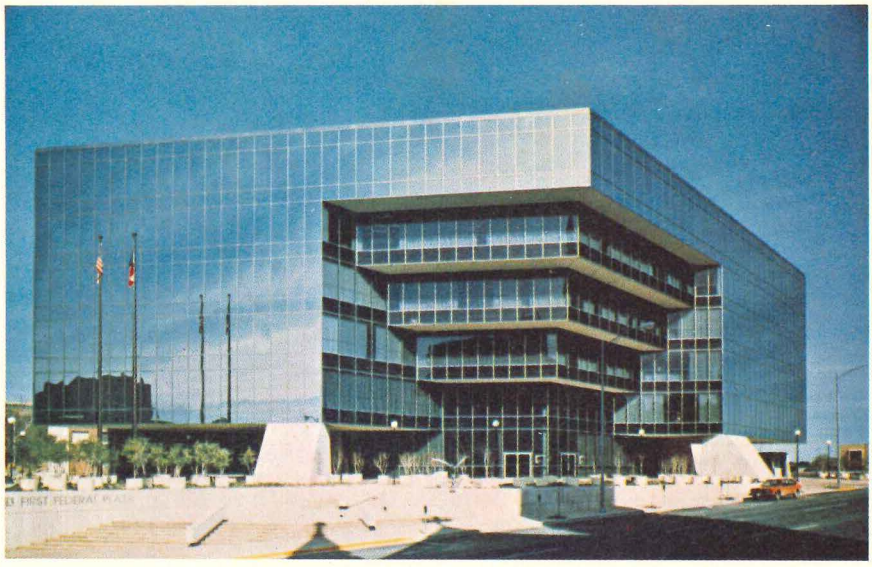


High-strength steel trusses

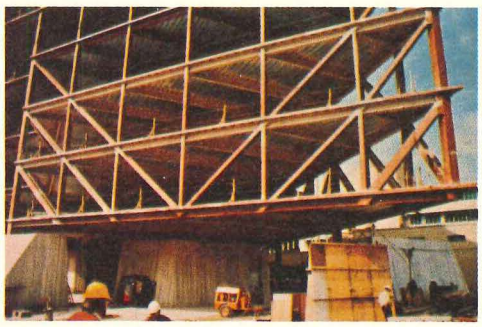
Three tapered-steel roof trusses, the longest of which is approximately 62 ft, carry the five-story-high, 72- and 90-ft-long cantilevered walls over the plaza. The trusses, 13 ft 6 in. deep at their highest point, are fabricated of ASTM A572 Grade 50 high-strength steel.

The east and west ends of the building are also cantilevered through the use of six-story-high exposed wall trusses. The west cantilevered end projects over the garage entrance to three sub-levels of parking. The east-end cantilever provides a sheltered drive-through area for the bank's drive-in teller units. The spans are 60 ft from the column to the ends of the cantilevered trusses.

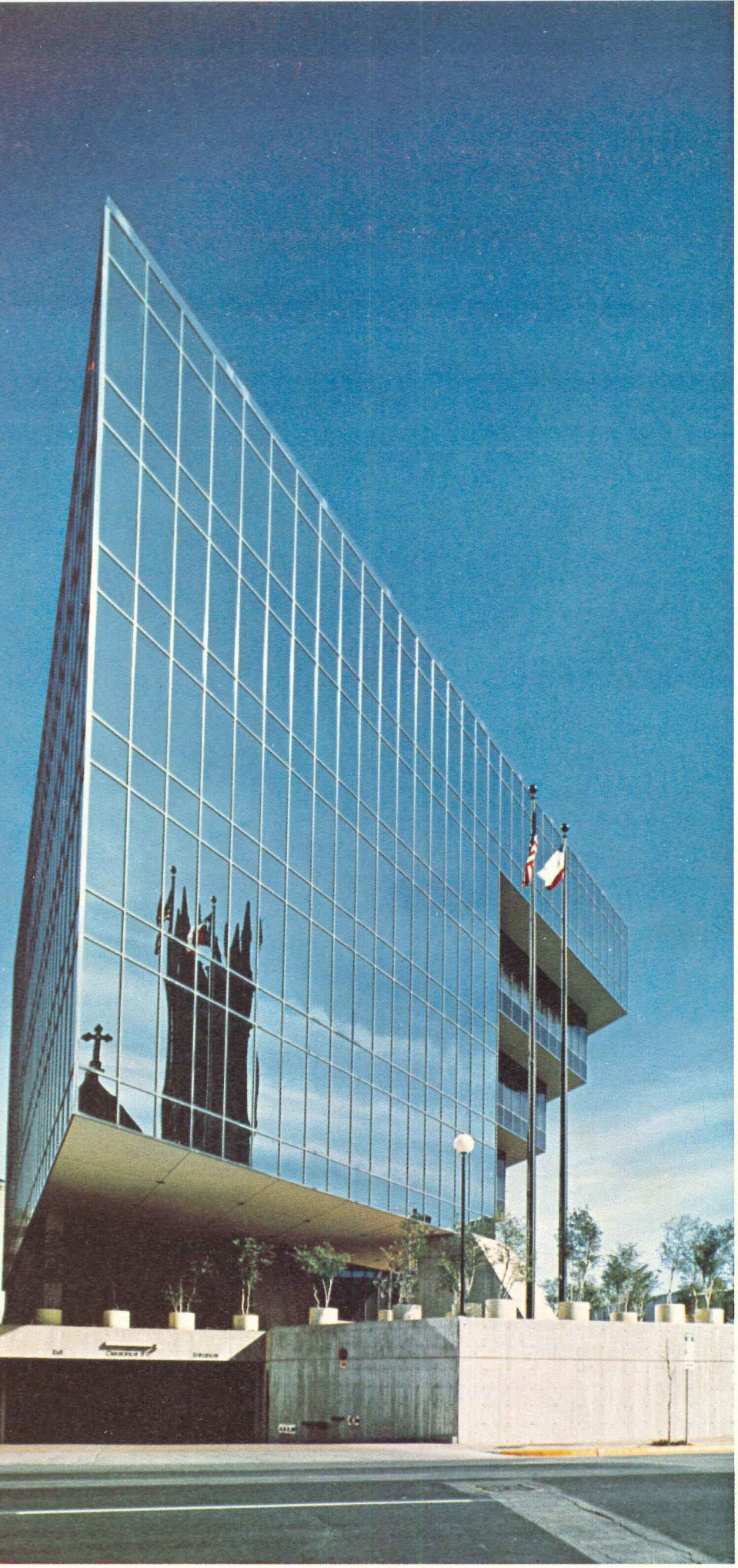
The trusses minimized the number of columns required to support the loads. This, in turn, provided the additional advantage of increased interior space flexibility.



First Federal Plaza, clad in mirrored glass, is oriented on the site to reflect the sun's rays away from the eyes of passing drivers.
The wall trusses, supporting the east and west ends of the building, are exposed on the interior to add an interesting architectural element.
Three tapered roof trusses support the five stepped cantilevered levels below.



High-strength steel trusses enabled the architects to create a unique cantilevered design for this six-level bank and office building. Bethlehem supplied 340 tons of steel for the project.



Composite design was used to economically reduce steel weight and permit smaller section sizes for the long spans. Composite beams and girders support and combine with the fire-resistive floor assembly of 3-in. composite steel floor deck topped with 3¼-in. lightweight concrete.

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News report continued from page 33

stated, "to consider how the rigidity of the system was responsible for the use of space and to see how the most matter-of-fact structure resulted in pattern and texture."

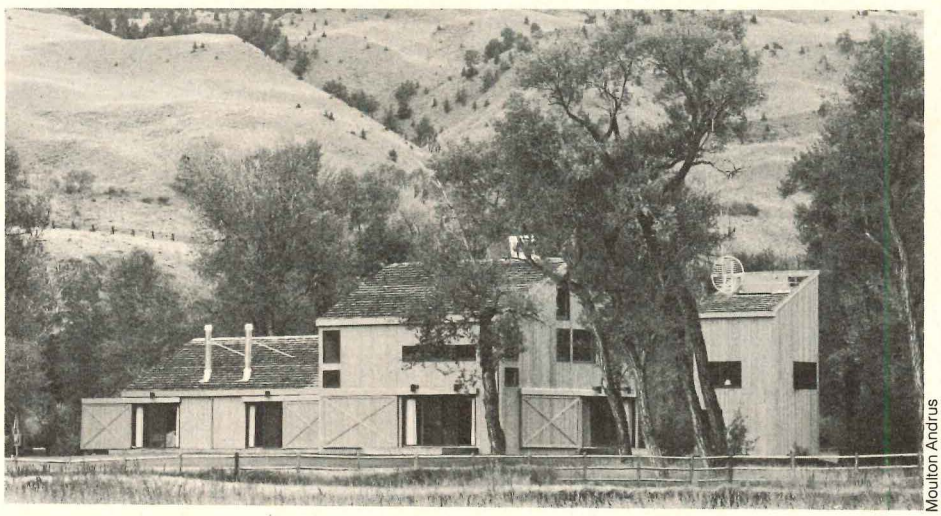
Other winners of the Twenty-five Year Award include (1977) Christ Lutheran Church, Minneapolis, by Saarinen, Saarinen & Associates and Hill, Gilbertson & Hayes Architects, and (1976) the 860–880 Lake Shore Drive apartments, Chicago, by Mies van der Rohe.

Wyoming house wins first award

A house in Park County, Wy, by architect Moulton Andrus won the only First Award in the awards program of the Portland Chapter of the American Institute of Architects. Five other projects won Honor Awards—four of them split between two firms. The jurors were David McKinley of Seattle, Stanley Tigerman of Chicago, and Michael Ross of Los Angeles, a P/A West Coast correspondent.

Honor Awards went to Robert Foote Jr. and William Wilson for The Crest Apartments, St. Helens, Or; to the Lewis & Clark College performing arts center, Portland, and to the YMCA fitness center, Portland, both by Broome, Oringdulph, O'Toole, Rudolf & Associates; and to the Douglas County Justice Services Building, Roseburg, Or, by the Zimmer Gunsul Frasca Partnership and to that firm's own office building in Portland.

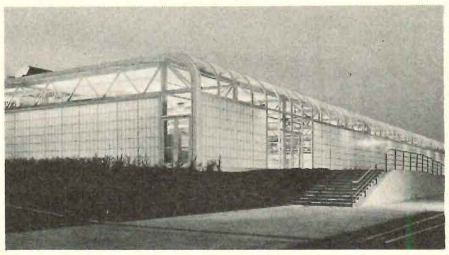
Residence in Park County, Wy, by Moulton Andrus of Portland.



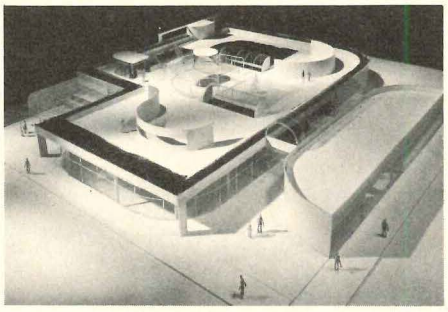
Moulton Andrus

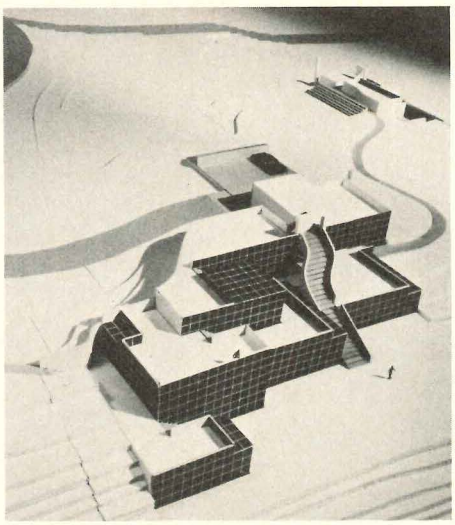
Four projects win Illinois AIA awards

The Illinois Council, American Institute of Architects, has named four winners in the 1977 State Awards Program. The Chicago firm of C.F. Murphy Associates was responsible for two of the projects—the Michigan City Public Library in Indiana and Saint Mary's Athletic Facility at Notre Dame, In. Stanley Tigerman & Associates won for the Tackbary House, Barrington, Ill, and Warren Hendrickson and Peter Pran won for the new ArchiCenter in Chicago. All four honor award projects received unanimous approval from the jury, composed of James Stirling, Richard Meier, and William Turnbull. The projects were selected from 22 recent winners in AIA chapter design award programs throughout the state.



Illinois honor awards to St. Mary's Athletic Facility (above) and new ArchiCenter (below).





Tackbary house, Barrington, Il, (above); Michigan City Public Library (below).

ASID preservation contest announced

The American Society of Interior Designers/Scalamandre Historic Preservation Excellence of Design Awards Competition is inviting entries for the 1978 judging. Deadline for submitting entries is June 1, and the winners will be announced in July at the ASID national convention in Washington, DC. Along with ASID, the sponsor is Scalamandre Silks Inc. The competition is open to ASID chapters, professional members, and student chapters. Entry information is available from R. Michael Brown, E.J. Audi Inc., 317 E 34 St, New York, NY 10016.

Scholarships offered

The Woman's Building in Los Angeles, a public center for women's culture, has received funding from the National Endowment for the Arts to continue its New Moves scholarship program. These grants provide two

[News report continued on page 40]

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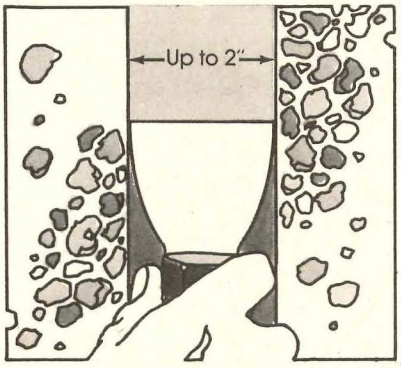

To be sure of good adhesion, the joint interface should be thoroughly clean before it's caulked. Form release agents and dampproofing coatings can interfere with sealant performance, so your best bet is to draw on Tremco's experience while you're still in the design stage.

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Openings can occur in even the most carefully constructed panels and joints, which will open the door to weather problems.

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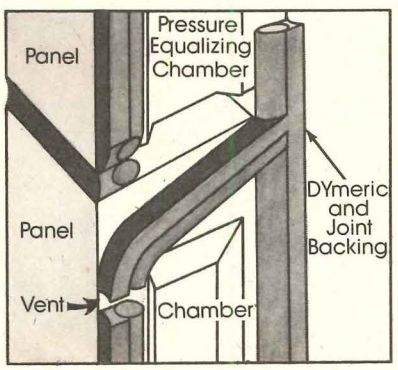
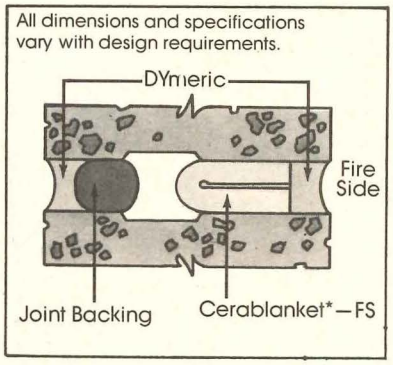


Resisting fire.

Although precast panels themselves are fire-resistant, the openings between them can be a hazard if a fire breaks out. The best protection: Tremco's exclusive fire-resistive joint sealing system that can achieve required fire endurances of two to four hours at the joint.



This system uses Tremco's DYmeric sealant and Cerablanket*-FS, a pure ceramic fiber blanket made from alumina-silica fibers and manufactured exclusively for Tremco by Johns-Manville. Under test conditions, this system prevented passage of flame or hot gases and stopped transmission of heat beyond the temperature limits in ASTM E-119.

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News report continued from page 36

full-time and 70 part-time scholarships. Programs available include the Feminist Studio Workshop in the arts and humanities, extension classes and a summer art program. Further information is available from Susan Albert Lowenberg, project director, Woman's Building, 1727 N. Spring St., Los Angeles, Ca 90012.

Yonkers exhibit on the avenue

"Warburton Avenue: the Architecture of a Neighborhood" is an imaginative exhibition bringing to public attention the all-important need of architectural preservation. In a variety of ways the creators of the exhibit—Hardy Holzman Pfeiffer Associates of New York—presented the message early this year at the Hudson River Museum in Yonkers. One method was to elicit written viewer response, which was posted on a wall. Wrote one: "Get your (****) together and clean up Warburton right now, dammit."

Warburton Avenue is a major thoroughfare lined, for the most part, with rundown Victorian homes and some commercial establishments. The exhibit concentrated on just over a mile of the street. Another technique to spark community awareness was to invite the Yonkers Studio Guild Camera Club to create a photo essay, which was displayed as part of the show. The "catalogue" for the exhibit was printed one Sunday in a local newspaper. The museum held workshops for people interested in do-it-yourself restoration, and the museum store sold (for 10¢ each) short how-to home improvement tips from fixing leaky faucets to buying paneling.

Visually, highpoints included the display of an actual façade from a demolished two-story frame house. The façade faced the stairwell leading to the exhibition area and created an exciting overture to the show. The other major element was the pictorial recreation of Warburton Avenue in a tunnellike "gallery." Both sides of the street were photographed with a computer-operated camera, the Globusscope, and images were printed on two continuous sheets mounted on either side of the tunnel to simulate the experience of driving along the avenue. The exhibit was commissioned by the museum.

Radio City grand foyer with Ezra Winter mural.

Radio City show for handicapped

As announced, the last Radio City Music Hall show was held in April closing a memorable era in motion picture and public entertainment. Like many of the showings the last month the hall was open, the final performance was a benefit, in this case a fund-raiser for hospitals for handicapped children. Even if persistent drives to find a way to save the hall are successful, the "Format," as Radio City personnel call the movie plus stage-show package, including the Rockettes, that has been a tourist attraction since 1932, probably will not be retained intact.

It also is unlikely that landmark and style conscious New Yorkers will let the lavish Art Deco hall go without a fight. Three hundred attended a hearing in March to consider landmark designation, subsequently granted. *Progressive Architecture* entered testimony in favor of designation. Radio City officials announced opposition to having the hall declared a landmark despite the fact that such status could mean a tax abatement or other incentives.

"Landmark status will be a deterrent to creative ideas that might save parts of the building," said Patricia Robert, a vice president. Designation would mean having to obtain the Landmarks Preservation Commission's approval prior to alterations or demolition.

Radio City management claims that for a decade it fought closing the hall in face of dwindling attendance and rising costs. Last year's deficit was $2.3 million. When told that a petition to save the hall had more than 70,000 signatures, the reply was "Good, that's less than three days' business." Every solution has been explored, said the hall's management, which is somewhat bitter at solutions proposed by Johnny-come-lately preservationists, whose ideas are viewed as merely stop-gap—such as holding television specials in the hall—or not feasible as permanent uses, or already explored and found ineffective.

Such ideas include subdividing the hall into cinemas I, II, and III or making it a concert hall (the acoustics reportedly are not concert quality, and some artists have refused to perform there).

Other ideas forwarded, such as the frequently mentioned but definitely out proposal to convert the hall into indoor tennis courts would save the shell but would destroy what is unique about it.

Selling alcoholic drinks is prohibited by a city ordinance; a casino idea is prohibited by state anti-gambling laws. Rock concerts fill the house, but the audience is destructive—the carpet has been cut and the brass doors

[News report continued on page 42]

Detail of 'The Warburton Avenue Mural' by The Globus Brothers, on view through April 30 at Hudson River Museum, Yonkers, NY.

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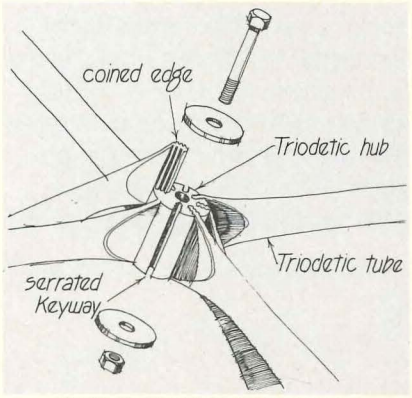

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San Bernardino County Museum, San Bernardino, California
Architect: VTN Consolidated, Inc., Irvine, California

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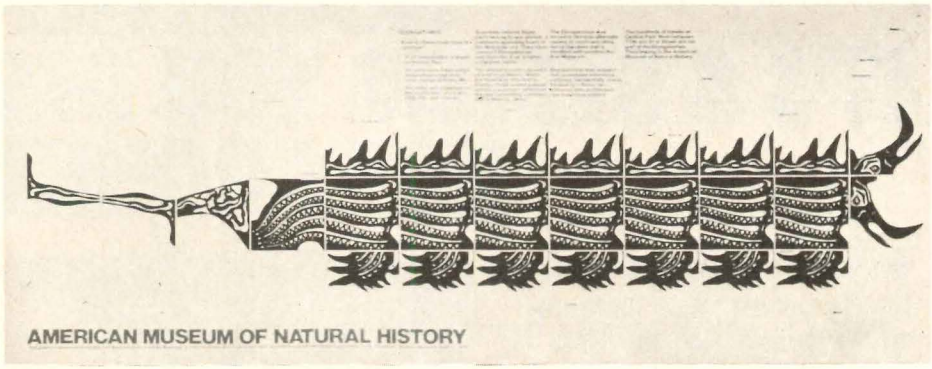
News report continued from page 40

covered with graffiti.

Now that movies are big box office, why can't Radio City make a profit? Reluctance on the part of film companies to give Radio City their top product is blamed. Companies would rather make their profit at smaller theaters over a longer period than at Radio City, which has to fill the 6000 seats several times a day. As for the hall's family movie policy, it never existed, said Ms. Robert. "Film companies assumed a 'standard' when it was convenient."

At a meeting following the landmark hearing, the commission decided for designation, 8:0, two abstaining. The building immediately becomes a landmark, but the action subsequently must be studied by the City Planning Department and eventually affirmed by the city's Board of Estimate. Following the Board's action, the building's owners may go to court, which Radio City president Alton Marshall said would be done if the Music Hall, which he called a "dead facility," is declared a landmark.



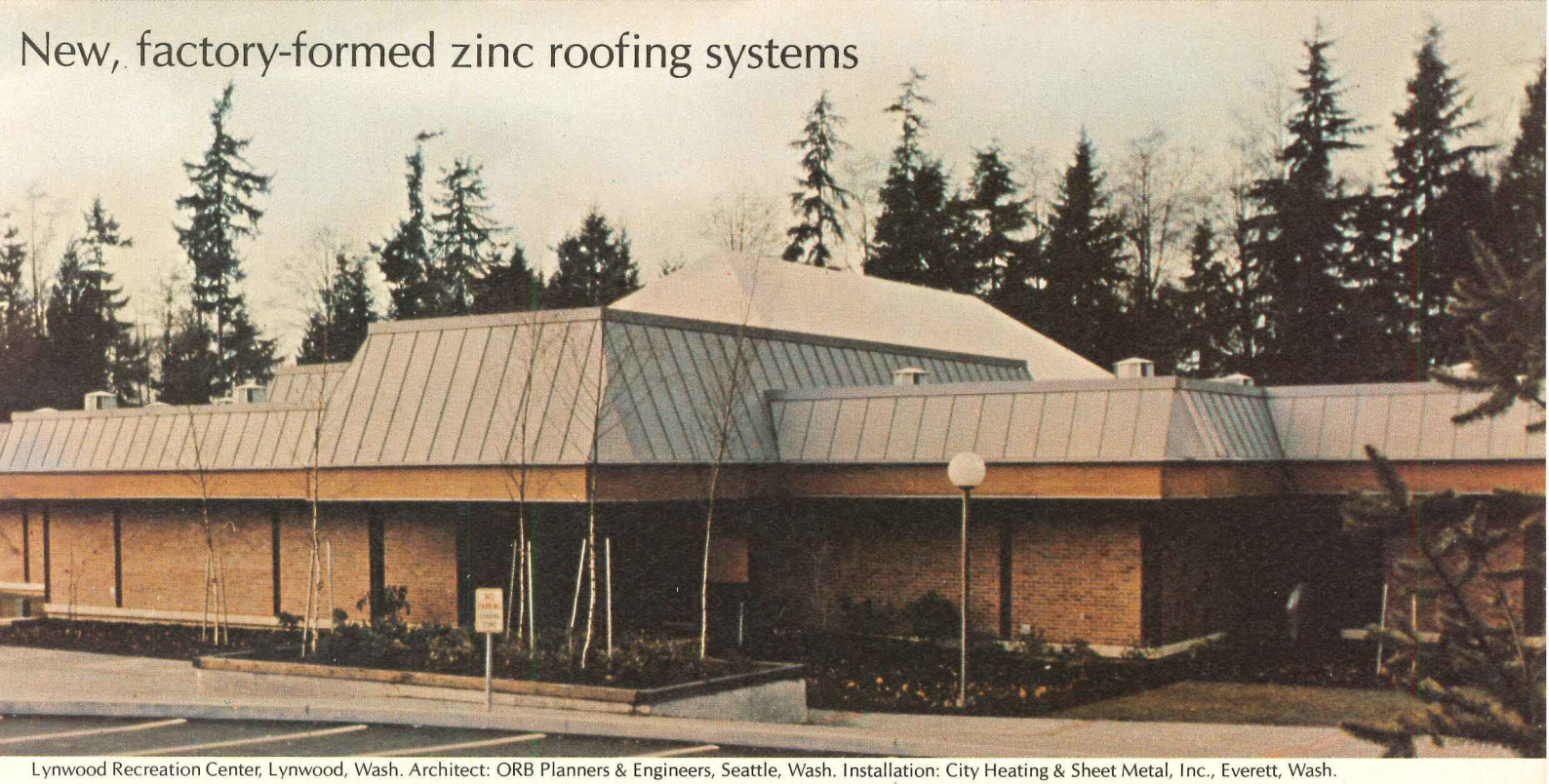
What is it? Posters alert travelers this is stop for the American Museum of Natural History.

Motion in the beholder's eye

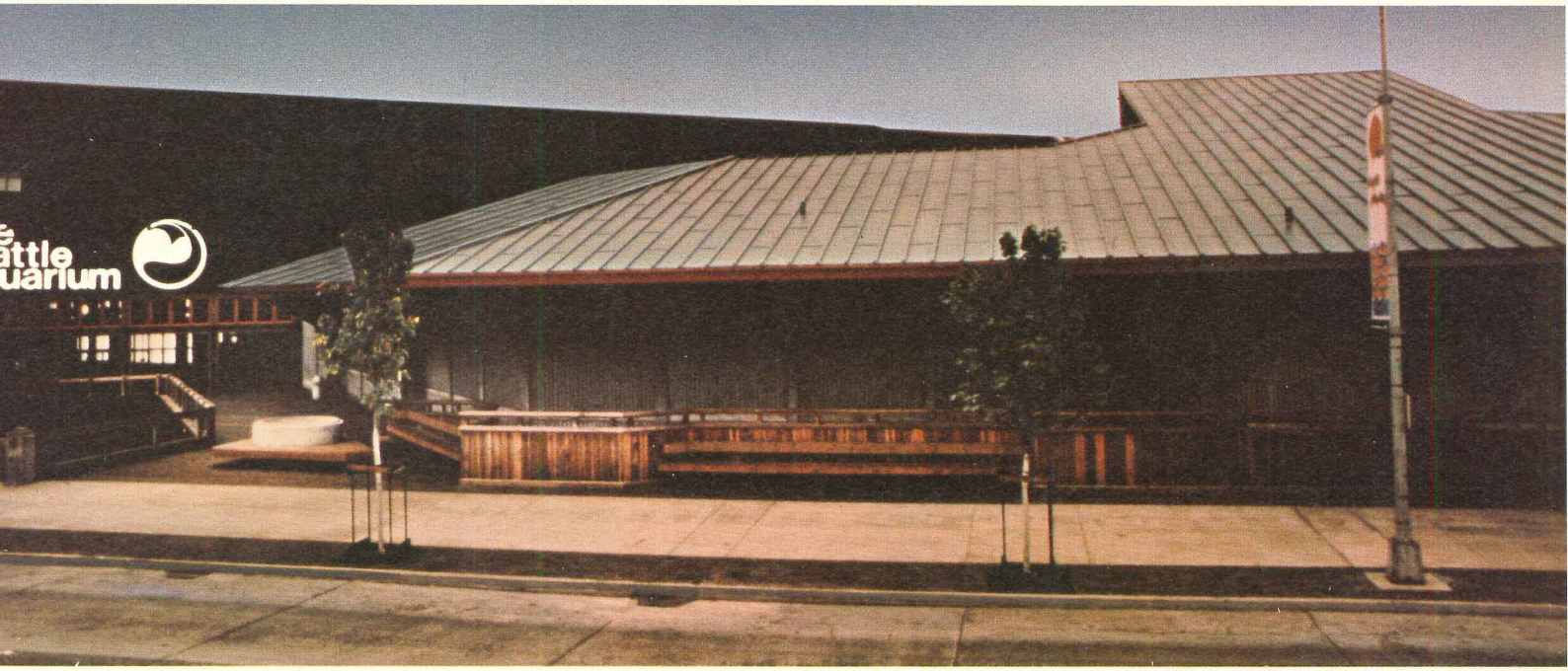
Whether the traveler is just passing through or patiently waiting, he is likely to note the new posters on the wall of the 81 St. station of the Independent Subway in New York 81 St. is the stop for the American Museum of Natural History, where people go when they want to see a dinosaur or a mummy. These posters, designed by Mayers & Schiff, a New York architectural and planning firm, tell all about the treasures of the museum in an intensely colored series color-bonded and rhythmically positioned from one end of the platform to the other. The aim was to instill a feeling of movement not unlike that of an animated film, although in this case the picture is

[News report continued on page 45]

New, factory-formed zinc roofing systems



Lynwood Recreation Center, Lynwood, Wash. Architect: ORB Planners & Engineers, Seattle, Wash. Installation: City Heating & Sheet Metal, Inc., Everett, Wash.



Seattle Aquarium, Seattle, Wash. Architect: Fred Bassetti & Company, Installation: Pacific Rainier Roofing, Inc.

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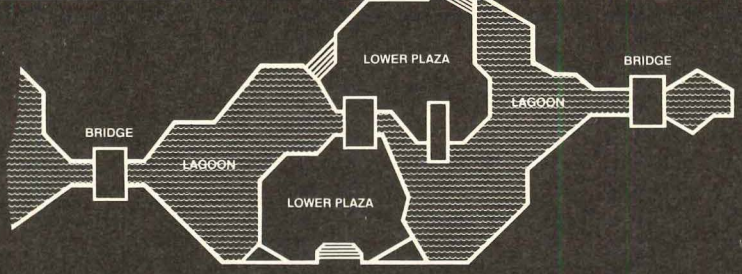

Red cedar makes a shopping plaza a welcome neighbor.

St. Mark's Shopping Plaza, Stockton, California. Architect: Al Saroyan, Jr., Architecture, Inc.

Compatibility with surrounding residential areas was one of the architect's key considerations in planning this distinctive shopping plaza. Richly textured red cedar shakes provided a beautiful—and practical—solution.

"Red cedar shakes were extensively used for roofing and sidewalls in order to lend unity and harmonize with the community's residential scale.

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Insulative ("R") values of roofing products shown below. Source: ASHRAE Handbook, and California Energy Design Manual.

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Cedar Shakes (Medium)	1.15
Cedar Shingles	.87
Built-Up Roofing, Slag	.78
Asphalt Shingles	.44
Built-Up Roofing, Smooth	.33
Asbestos Cement Shingles	.21
Slate	.05

Red Cedar Shingle & Handsplit Shake Bureau

News report continued from page 42

stationary and the eye is moving. The key figure of the posters is a make-believe animal created by assembling squares depicting portions of a dinosaurlike creature. Printed descriptions, equally fractured, reinforce the fantasy animals with humor and make the creatures memorable, puzzling, and contemporary. Sometimes the trains even seem to arrive faster. Fantasy that!

Recycled Wainwright and Post Office

The Wainwright Building and the Old Post Office, three blocks apart in the St. Louis business core, are scheduled for renovation and recycled use. Both the historic properties have been long vacant; both pulled back from the brink of demolition.

The 1891 Wainwright, Adler & Sullivan's pioneering of the skyscraper aesthetic, will house St. Louis administrative and executive offices for the State of Missouri (P/A, Dec. 1974, p. 22) and will be connected to new facilities on the other three-quarters of its block. The two state projects will proceed simultaneously, with construction to start in April and completion expected by 1980. The Wainwright façade restoration and interior remodeling is budgeted at $6.4 million, the annex at $6.5 million, both financed by state revenue bonds. The architects—Hastings & Chivetta, St. Louis, in association with Mitchell/Giurgola of Philadelphia and New York—won a 1974 competition. Work was delayed during a dispute in the legislature over the location and funding of other state buildings.

The $15-million restoration of the Old Post Office, built 1874–82, and its conversion to mixed use for 24 federal offices and commercial tenants, is scheduled for completion by 1982. The General Services Administration will choose an architect by the end of March from three firms now in the second round of a design competition. (Eugene J. Mackey III & Associates, and William B. Ittner, Inc., both of St. Louis, and Harry Weese & Associates, Chicago.)

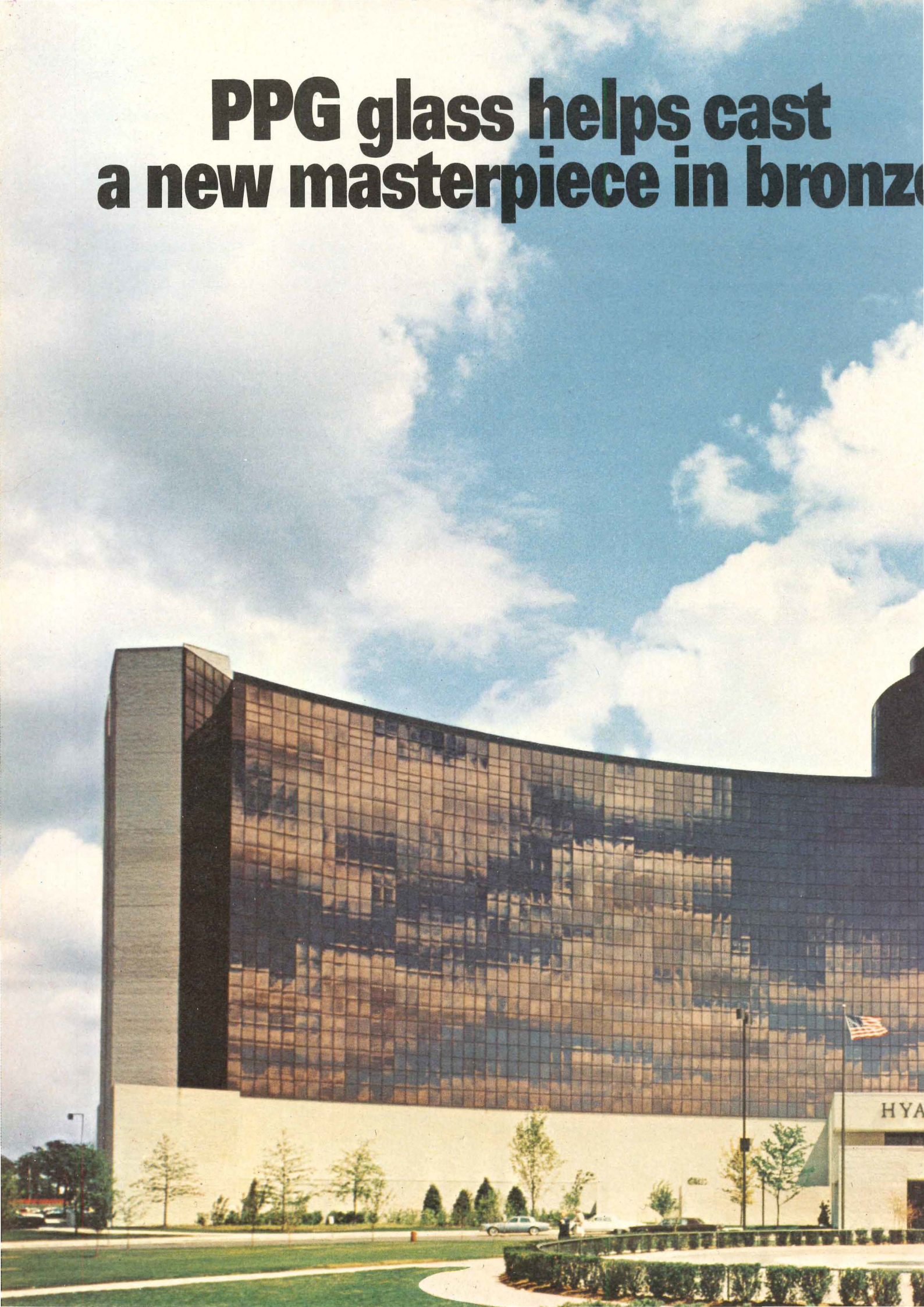
The building is the last survivor, outside Washington, of the major Second Empire structures by Alfred B. Mullett, supervising architect for the Treasury Department from 1866 to 1874. It occupies a full block in the geographic center of the business district, and was the focus of a long controversy over use of the block after federal offices were moved to other buildings.

Luxurious Willard to be reopened

The historic Willard, a luxury hotel in Washington, DC, has been purchased by the quasi-governmental Pennsylvania Avenue Development Corporation for $4.55 million. PADC intends to lease the Willard to a developer who will restore it and reopen the Willard as a first class hotel. The sale came a year after the Court of Claims ruled the U.S. government was in effect the

[News report continued on page 50]

PPG glass helps cast a new masterpiece in bronz



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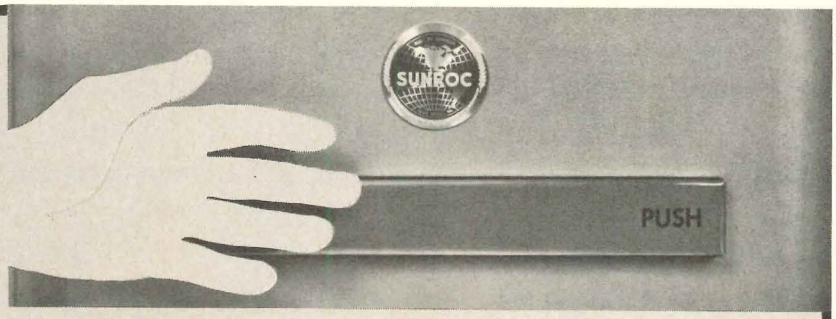
Owner: Ford Motor Land Development Corporation
Operator: Hyatt Hotel Corporation, Burlingame, California



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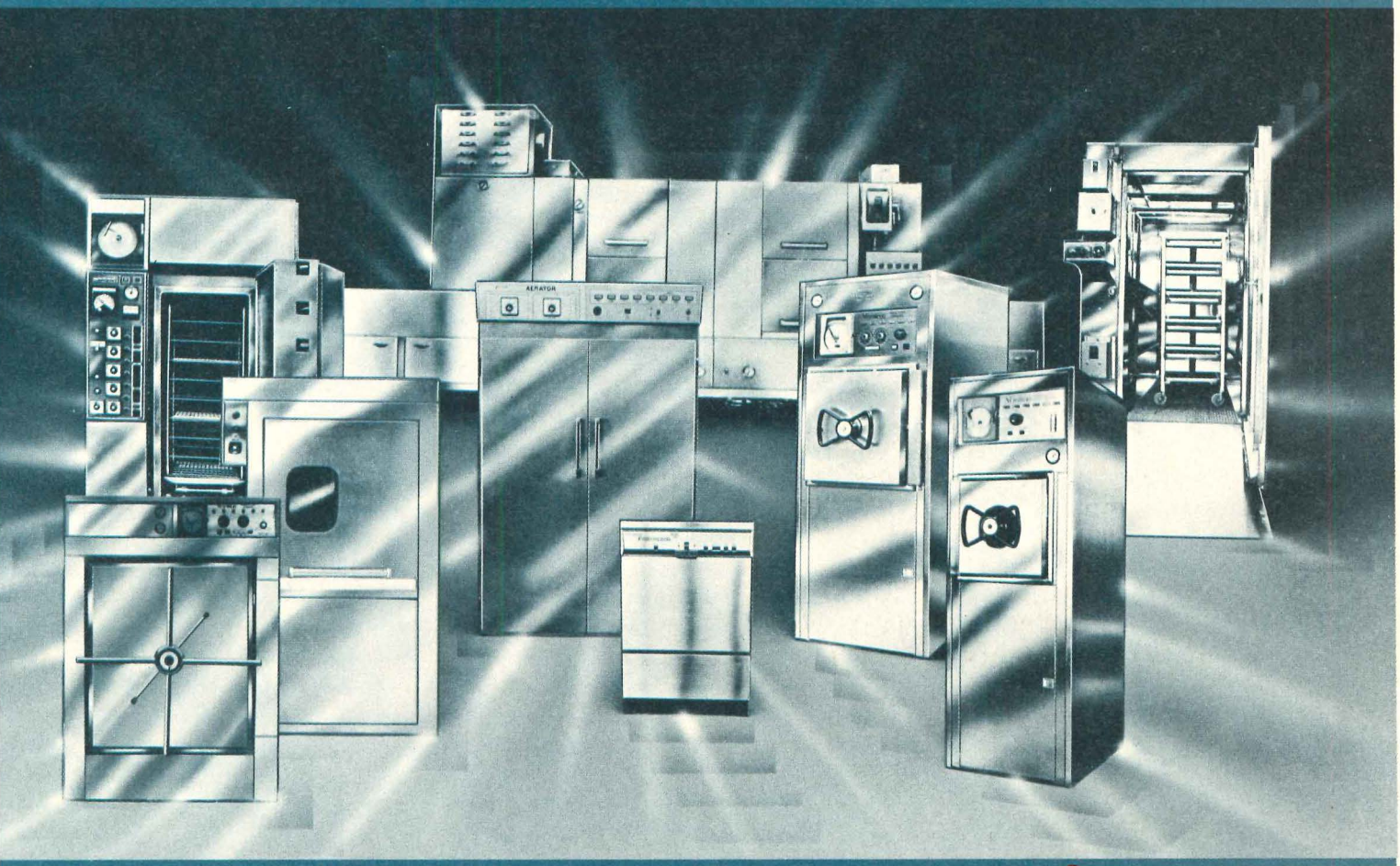

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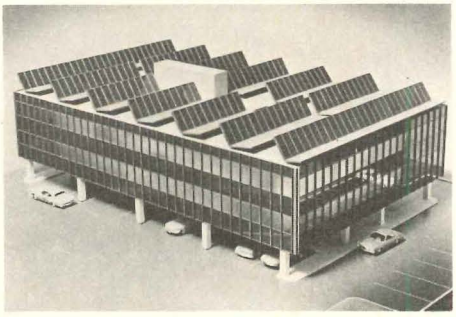
News report continued from page 45

hotel's owner since it had "so impeded and restrained (the owners) as to deprive them of any reasonable use of their property." This year the Justice Department sold the hotel to PADC. The deed had been held by the Attorney General. The previous owners had intended to construct a modern office building on the site, at Pennsylvania Avenue and 14 St. NW.

Office building energy retrofit

The Copper Development Association initiated an all-copper solar collector retrofit project for an office building in Stamford, Ct, using a $420,000 grant from the US Energy Research and Development Administration to finance part of the cost. Consultant Eric Wormser of Wormser Scientific Corporation said he chose the collector panels by SunWorks of New Haven on a cost effective basis from among available products by 160 manufacturers; of these, he said, 20 firms produce the bulk of collectors on the market. The system consists of 138 collectors and reflectors and will provide 100 percent of the building's daytime requirements. At night or on cloudy days, supplementary heat will come from water heated by electricity during off-peak utility hours. Wormser said he believes this project to be the first to use a combination collector/reflector system for use in winter months. The reflectors enhance by 46 percent the effectiveness of the solar collectors. The two-and-a-half-story office building contains 25,000 sq ft and was completed in 1969. Zoning variances were required before installation of the solar system could proceed, since the building is in a special design district and also was subject to an ordinance that limits to 25 percent the roof area covered by mechanical equipment.



All-copper solar collector retrofit.

Personalities

Nancy Holmes of Mobile, Al, has been elected chairman of the Board of Advisors of the National Trust for Historic Preservation. **Paul Muldawer,** president of Muldawer & Patterson, architects and planners of Atlanta, has been reelected vice chairman.

The following have been named to the American Institute of Architects government affairs department: **David A. Caney,** director of congressional liaison; **John M. Devaney,** assistant director of congressional liaison; and **Steven L. Biegel,** assistant director of federal liaison.

Constance Lieder, Baltimore planning and housing consultant, has been elected president of the American Institute of Planners. **Reginald W. Griffith** of Washington, DC was elected first vice president.

Charles M. Sappenfield, FAIA, dean of Ball State University's College of

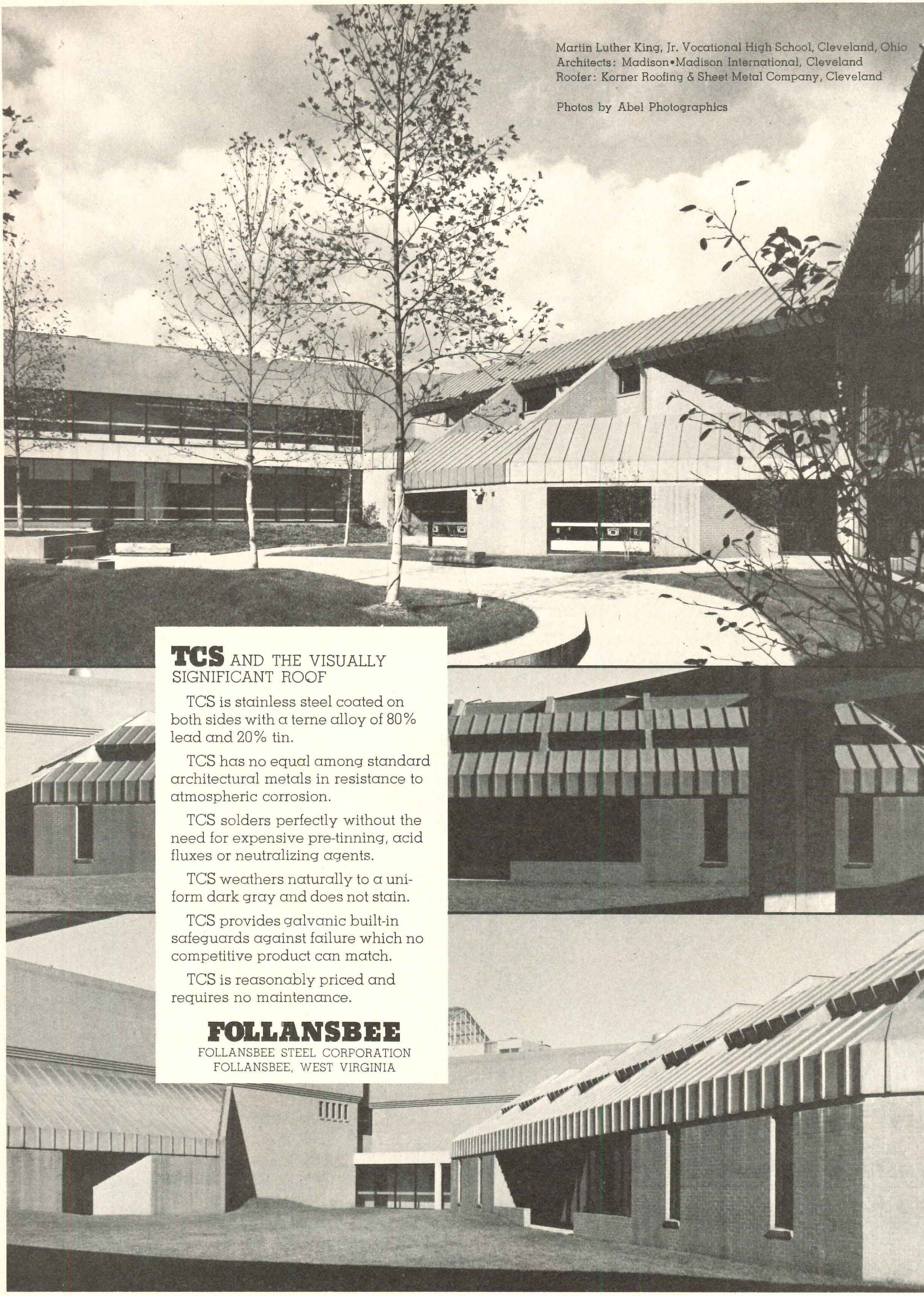
Architecture and Planning, Muncie, In, has been elected chairman of the board of directors of the Indiana Architectural Foundation.

Robert M. Dillon has been named executive assistant to the president of the National Institute of Building Sciences, Washington, DC.

Calendar

Through Apr. 29. "Immanent Domains," Herbert Johnson Gallery, Cornell University, Ithaca, NY. Exhibit consists of houses designed by Amsler, Bakanowsky, Lyndon, Machado, McGuire, Schwartz, Silver, Silvetti, and Wampler. Subsequent showing **May 1–30.** AIA Headquarters, Philadelphia.
Through June 11. "Dolley and 'The Great Little Madison,' " The Mint Museum of Art, Charlotte, NC. Subsequent exhibit: **July 8–Aug. 20.** The Virginia Museum of Fine Arts, Richmond.
Through July 30. "The Decorative Designs of Frank Lloyd Wright," Renwick Gallery, Washington, DC.
Apr. 9–June 4. "Travel Sketches of Louis I. Kahn," Kimbell Art Museum, Fort Worth. Subsequent 1978 showings: **June 16–Aug. 13.** The Drawing Center, New York; **Sept. 22–Dec. 31.** AIA Foundation, The Octagon, Washington, DC.
Apr. 10–11. Barrier-free buildings workshop '78, presented by *Progressive Architecture,* New York. Subsequent workshops: **Apr. 17–18.** Chicago; **May 1–2.** Atlanta.
Apr. 14–15. "Positions in Architecture III" symposium, Rhode Island School of Design, Providence.
Apr. 14–16. Second annual preservation convocation, sponsored by the Preservation Alumni of Columbia University, New York.
Apr. 15. Postmark deadline for entries to "Innovations in Housing" awards program, sponsored by American Plywood Association, *Progressive Architecture,* and *Better Homes & Gardens.* Mail entries to: Innovations in Housing, P.O. Box 2277, Tacoma, Wa 98401. Submissions must be received by Apr. 28.
Apr. 17–19. Annual apartment builder/developer conference and exposition, Georgia World Congress Center, Atlanta.
May 3–5. National engineering conference, sponsored by the American Institute of Steel Construction, Los Angeles.
May 11–14. SOLARCON CHICAGO, Merchandise Mart.
May 17–20. International Federation of Interior Designers world congress, Washington, DC.
May 21–24. American Institute of Architects annual convention, Dallas.
May 26–28. Aspen Energy Forum, sponsored by Roaring Fork Resource Center.
May 28–30. Urban Land Institute spring meeting, New Orleans.
June 11–16. International Design Conference in Aspen.
June 14–16. NEOCON, National Exposition of Contract Interior Furnishings, Merchandise Mart, Chicago.
June 18–21. Construction Specifications Institute annual convention, San Antonio.
July 22–25. American Society of Interior Designers national conference, Washington, DC.
Aug. 10–12. International Disabled Expo, seminar, O'Hare International Exposition Center, Chicago.

[News report continued on page 54]



Martin Luther King, Jr. Vocational High School, Cleveland, Ohio
Architects: Madison•Madison International, Cleveland
Roofer: Korner Roofing & Sheet Metal Company, Cleveland

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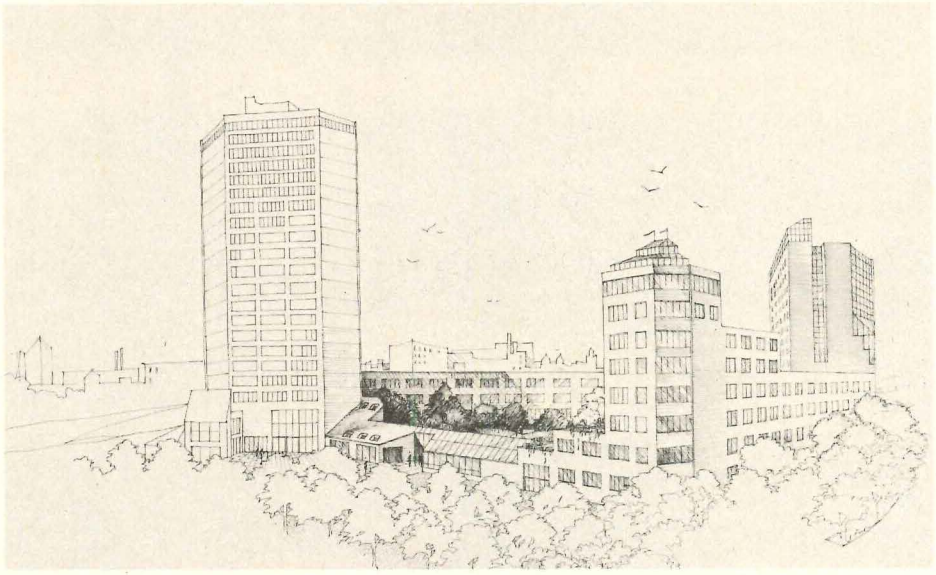
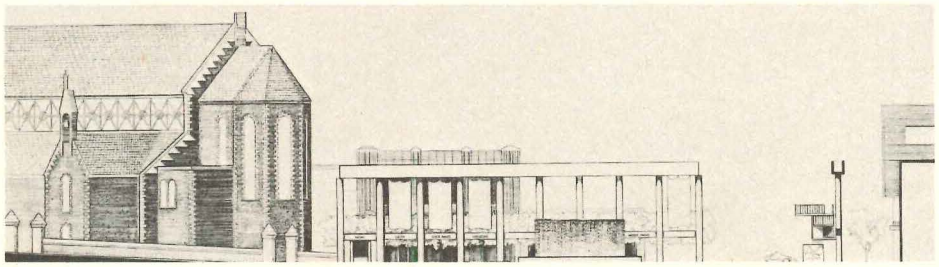


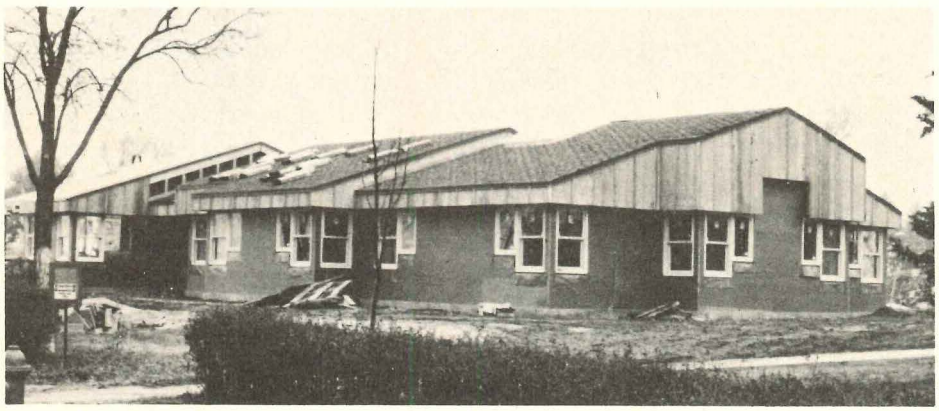
1

1 New Haven senior housing—Completion in the early 1980s is expected for an expansion of the New Haven Jewish Federation housing project for senior citizens. The buildings, by Charles Moore, will add some 200 units of medium- and low-rise housing to the 217 units in the 21-story Tower One. The project is located south of the New Haven, Ct, business district, and has a HUD housing fund reservation of $4,085,000 for financing. The housing will participate in the Section 8 rent subsidy program.



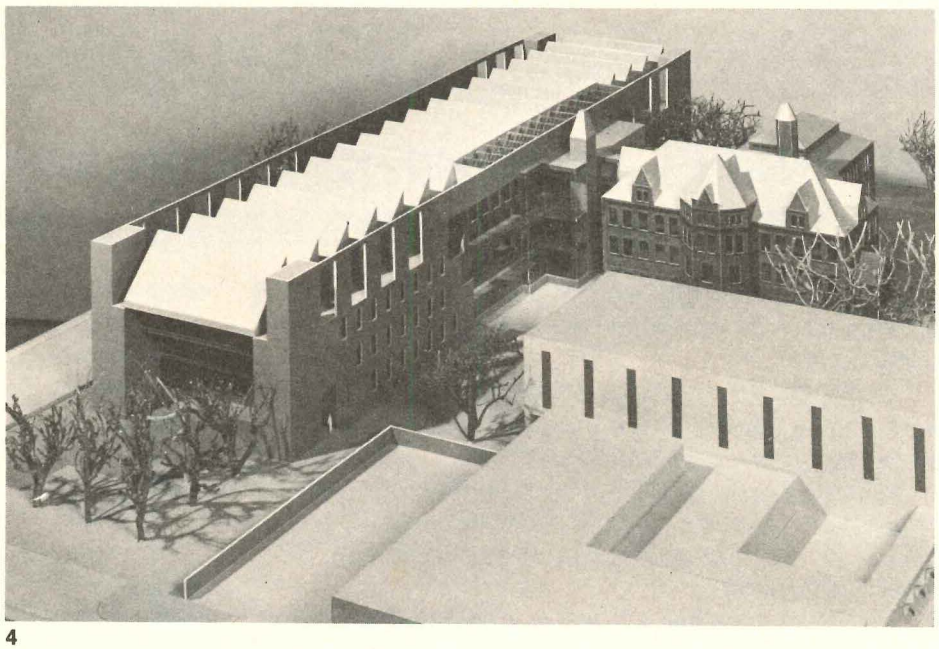
2

2 Yonkers square—A single structure designed to establish place, scale, enclosure, rhythm, and homogeneity will be completed this fall in Yonkers, NY, as a city project aimed at revitalizing the downtown. "Square: Plaza and Colonnade" was planned by the Department of Development and funded by Community Development. Walter Brown and Jeffrey Schlosberg Architects of New York are the designers of the structure, which includes a new sign system for business display, seating, newsstand and information booth, clock, and waterfall. A light control console in the information booth may be used to create special effects for festive occasions and theatrical performances on the square.



3

3 Retarded half-way residence—Arrowstreet of Cambridge, Ma, has designed a community of residential units for the mentally retarded for Bethphage Mission, operated by Lutherans in Axtell, Nb. The housing reflects the Mission's policy change from long-term care to training for independent living. Eight individuals will share each houselike unit, which will have sky-lit foyers, living/dining rooms with cathedral ceilings, and a den. Two houses will share a common kitchen.



4

4 Nebraska architecture building—The office of Bahr Vermeer & Haecker of Lincoln and Omaha won over five other contenders in a competition to design the expansion of the University of Nebraska College of Architecture in Lincoln. The program was to save the historically significant building, done in Richardsonian style, and also incorporate the neighboring brick building to the west, the former law school. The winning solution links the two with a glass atrium providing the major entry and orientation—including elevators so that it is accessible to the handicapped. The law building is enveloped by the new building which reveals parts of the existing building. A sawtooth roof provides north light monitors and frames for the future application of solar collectors.

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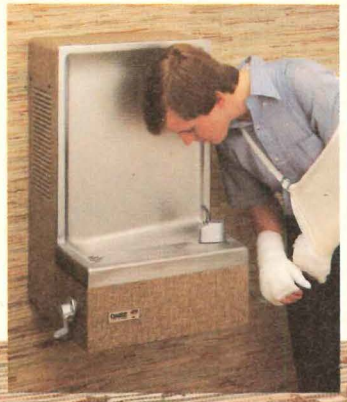

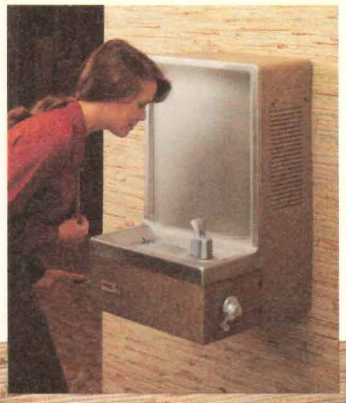

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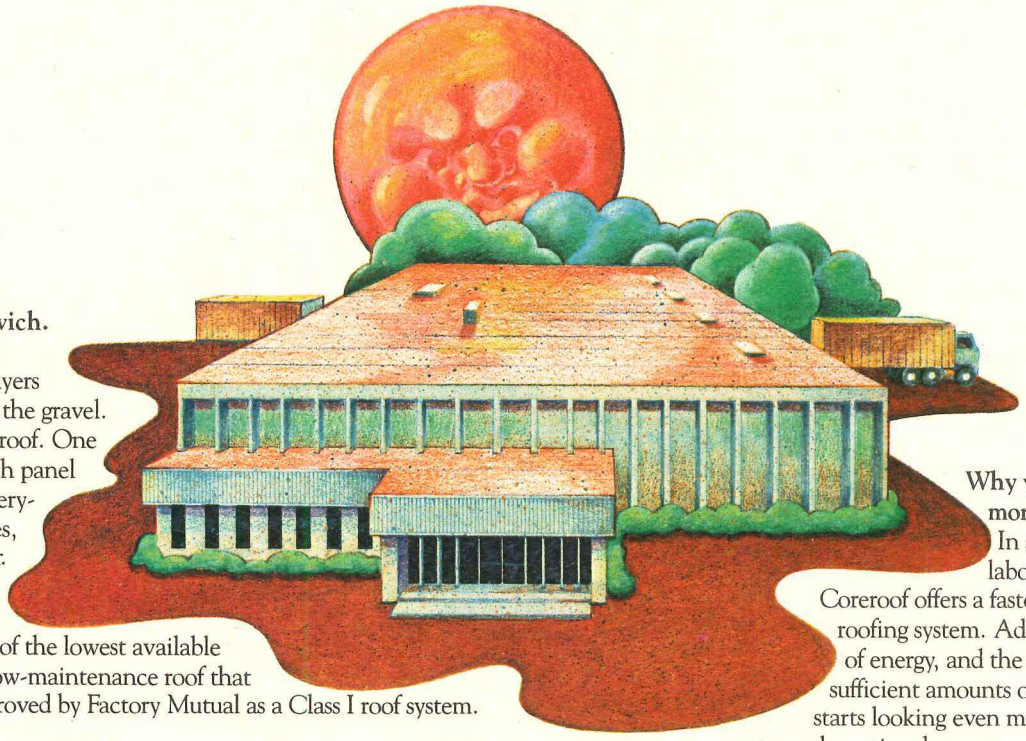

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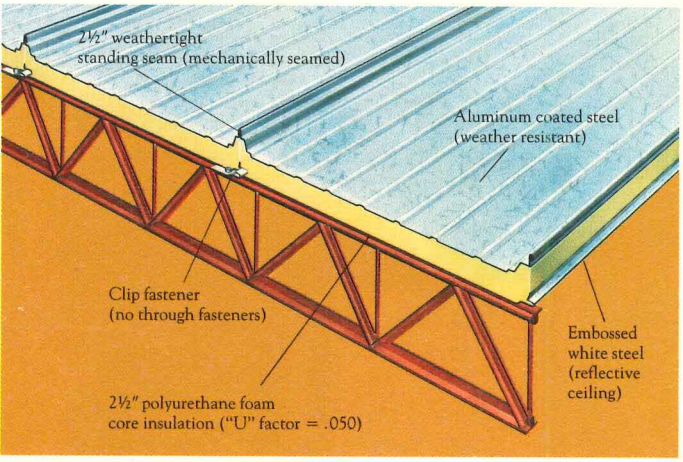

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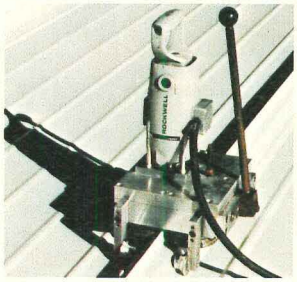

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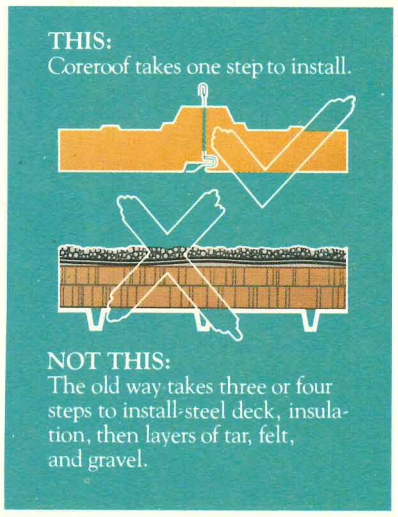

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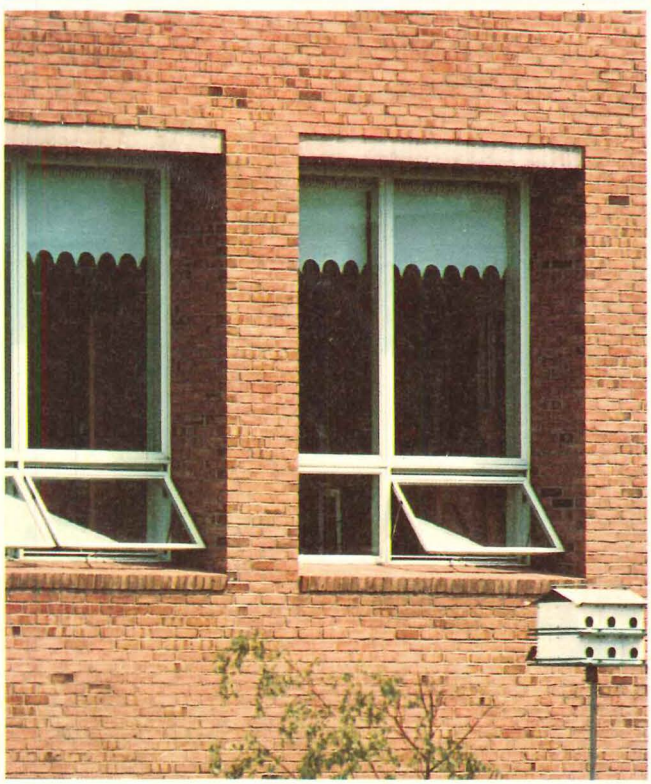

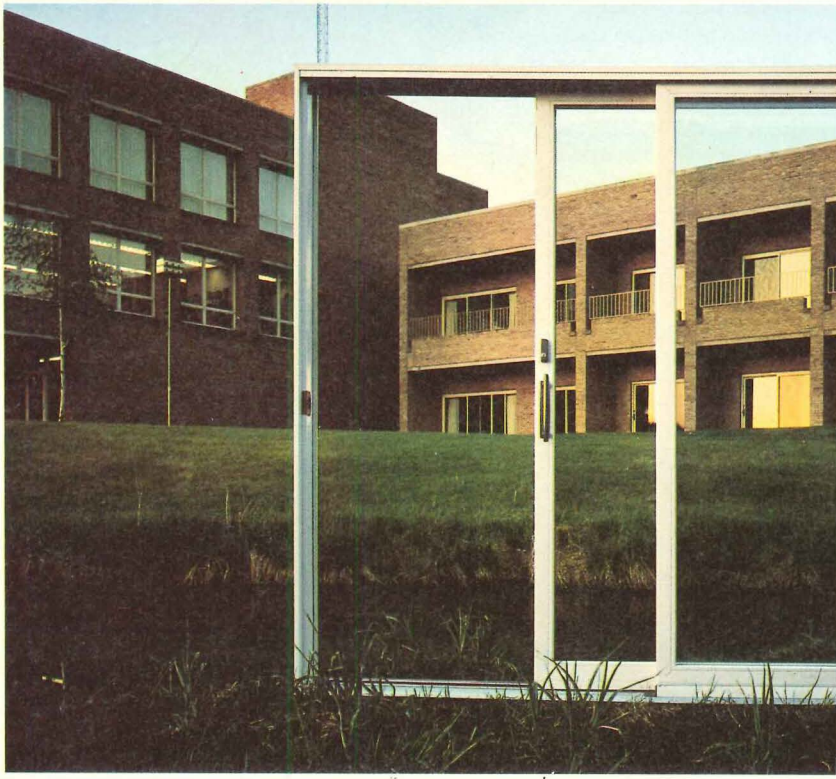

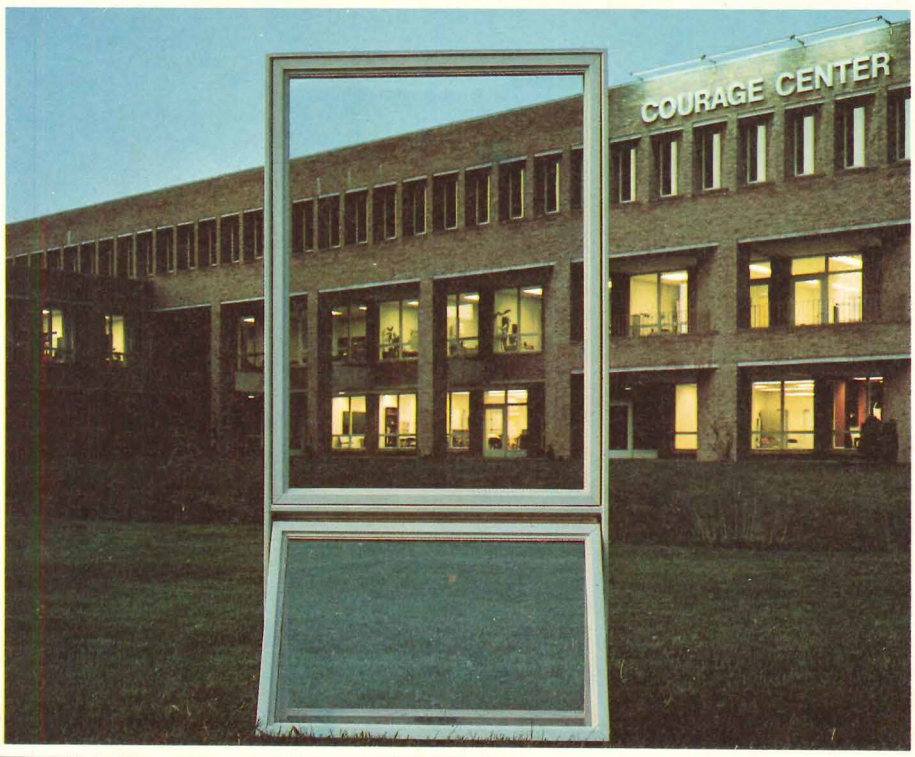
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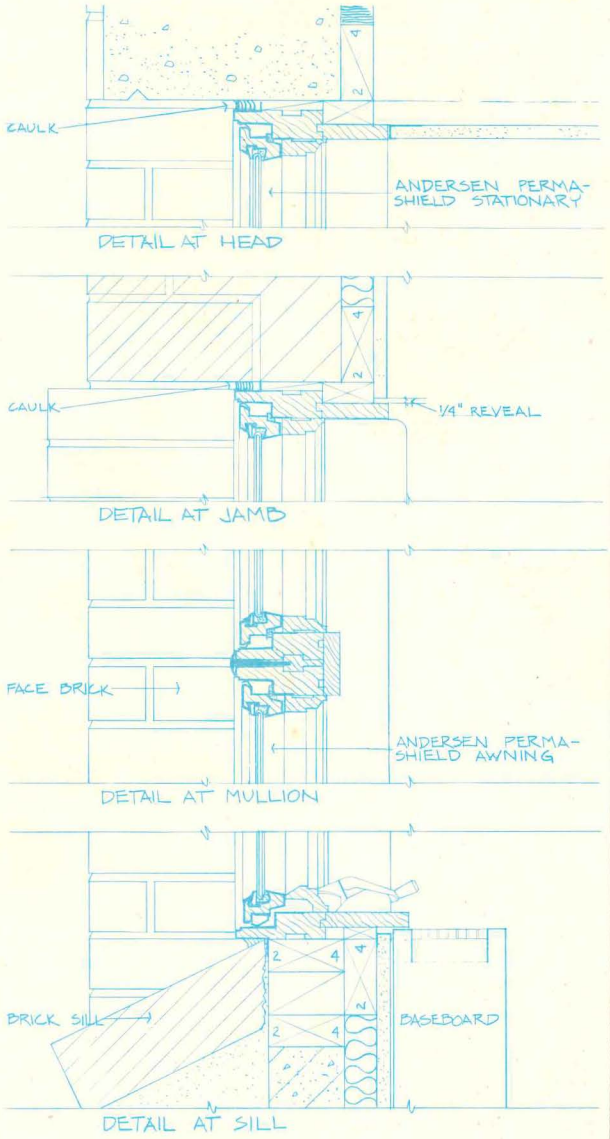

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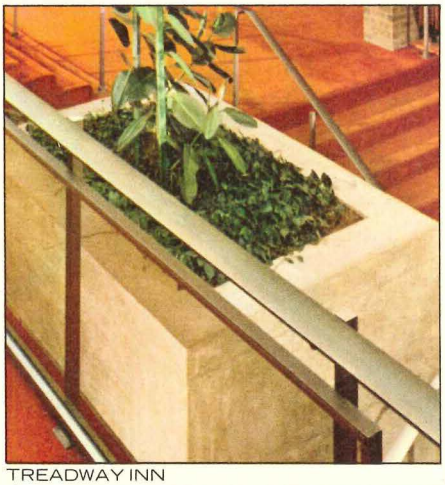

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Bearing down on barriers

Jane Fonda and Jon Voight in "Coming Home," Copyright © 1978, United Artists Corporation, all rights reserved.

Barrier-free design is now often required by law. How architecture will respond to 36 million handicapped Americans is examined in this special issue of P/A.

If the turbulent decade of the 1960s left behind nothing else, it left a new sense of awareness of individual freedom and liberty that has continued to grow into the 1970s. Today, ethnic groups, the elderly, women, and almost any other individual or group who feel its rights denied or feel discriminated against is much less likely to tolerate those conditions than before. While much has been said and written about these groups, less has been publicized about another sector—the handicapped. Yet they, too, have been discriminated against and have been denied rights. If the handicapped, like the other groups, are beginning to be seen in a different light now, part of the reason for this is directly related to efforts they have made on their own behalf. Through organization, protests, and lobbying in Washington and at state levels, new and significant legislation has been enacted in the past several years that now guarantees as law many rights of the handicapped that were once denied.

Such was not always the case. I remember a situation at college in the early 1960s. If you stood in front of Harris Hall almost any morning you could see Professor Butler arrive about a half hour early for his class. It was most unusual for anyone to arrive early for anything at the large southern university, but Prof. Butler had a problem. A Korean War wound had left him paralyzed from the waist down. With crutches he could manage a flight of stairs in about ten minutes. The problem was compounded, though, because not all of his classes were on the first or even the second floors, and all of his classes were in the oldest campus buildings where there were no elevators.

In order to go up the stairs, Prof. Butler backed up each step, one at a time. With both crutches on one step, he could raise both legs up to the next step behind him. Then, while maintaining balance with one crutch on the lower step, he could raise the other crutch to the higher step. By maintaining balance with the crutch on the higher step, he could bring the one on the lower step up to that level. This process would be repeated until he got to whatever floor the class was on. He also went down the stairs backward, essentially reversing the process.

In retrospect, it seems now that the strangest thing about Prof. Butler's predicament was not that he went up and down stairs backwards, but that no one ever talked about the fact that he did. In those years, if you had such a condition you were not supposed to make a fuss about it, and neither was anyone else. If Prof. Butler's disability was ever mentioned it was referred to as his "condition," and according to an unwritten code, the subject was dropped as quickly as possible. The university seemed oblivious to the problem. No apparent attempt was made to accommodate Prof. Butler in ground-floor classrooms, and in the vast faculty parking lot he had to fight for a convenient space, even if it took him twice as long to walk to class as anyone else. But Prof. Butler never complained; his attitude seemed to be that his "condition" was his problem and that he should not ask for special consideration, which was not forthcoming in any case. The general attitude advocated that if the problem were ignored, it would not exist.

To some degree that same attitude persists today. In most public transportation, places of entertainment, restaurants, and hotels, there is no or inadequate accommodation for the handicapped. There seems to be little awareness or concern that 36 million Americans are denied many of the ordinary things of life that are easily available to anyone else. When P/A, for instance, recently telephoned 14 of the largest New York hotels to ask if those in wheelchairs could gain access to their public spaces, only six could answer affirmatively. Of the remaining eight, some said access was not possible, and some did not know whether or not it was. When the question was pursued further, to ask if wheelchairs could fit through guest room doors and bathroom doors, only one could answer positively; the others either said no or did not know.

Legislating a barrier-free environment

Federal legislation aimed toward making the built environment barrier free actually began ten years ago with Public Law 90-480, the Architectural Barriers Act of 1968. One earlier important document, however, which was drawn up in 1961, was to have considerable influence on most legislation that was to follow. The American National

Photo: Barrier Free Environments, Inc.

Standards Institute's "Specifications for making buildings and facilities accessible to, and usable by, the physically handicapped," known as ANSI Standard 117.1, was designed to be applicable to all buildings and facilities used by the public. It describes certain minimum conditions concerning building design, parking, washroom facilities, and site grading, among other things, that could make buildings accessible. It was basically a performance standard that specified general criteria instead of detailing specific dimensions for every design element.

When the Architectural Barriers Act was passed in 1968, ANSI Standard 117.1 was selected as the standard to be followed. This Act stated that "any building constructed in whole or in part with federal funds must be made accessible to and usable by the physically handicapped." Compliance with the Act, however, was voluntary. It was not until 1973 that it became mandatory for federal buildings to be accessible to the handicapped.

Implementation of Public Law 93-112, the Rehabilitation Act of 1973, was left up to the Department of Health, Education, and Welfare. The law was enacted in part to make up for some of the ineffectiveness of the Architectural Barriers Act. Section 502 of the Rehabilitation Act established The Architectural and Transportation Barriers Compliance Board as an enforcement mechanism to ensure compliance with the Architectural Barriers Act. The board has the authority to conduct investigations, hold public hearings, and issue any orders necessary to insure compliance with the Act. It also has the power to withhold funds from organizations that fail to comply.

Section 504 of the Rehabilitation Act of 1973 was signed into law by HEW Secretary Califano in April 1977, following weeks of demonstrations by handicapped people who were frustrated by the years of delay in implementing the Act. It went into effect June 1, 1977. Called the Bill of Rights for the Handicapped, Section 504 can be used to bar federal funds from anyone who discriminates against the handicapped. The section states that "No otherwise qualified handicapped individual in the United States . . . shall, solely by reason of his handicap, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." These regulations applied only to HEW funds until Jan. 7 of this year when HEW, as the office in charge of implementing the regulations, extended their range to cover funds coming from all federal offices. This means that in addition to such institutions as schools, hospitals, and museums, other organizations, such as public housing agencies and local transit systems, must now comply with the regulations. Some 30 additional federal offices are required to draw up their own regulations, by April 1, and publish their rules for implementing Section 504 by August.

Under the current regulations, all new buildings receiving funds from HEW "must be designed and constructed to be accessible to handicapped persons from the start." Buildings renovated after June 1, 1977, must be made accessible to the "maximum extent feasible." For existing buildings, the regulations state that structural alterations required to make programs accessible be completed by June 1, 1980.

The regulations of Section 504 do not require that every existing building with programs receiving federal aid be completely accessible to the handicapped. The object of the law is to make programs accessible, not every space in every building. A school, for instance, could comply with the regulations without installing ramps at all of its buildings if it could make its curriculum available in other ways, such as by reassigning classes or by initiating home visits. Structural changes to make programs available would be required only if such alternatives were not possible. All programs not requiring structural changes for accessibility were required to be available to the handicapped within 60 days of the regulation's effective date of June 1, 1977.

Section 503 of the Act states that an employer cannot refuse to hire a qualified handicapped individual who could perform a job with "reasonable accommodation," yet the regulations also allow exceptions in situations of "undue hardship." But what do such phrases as "reasonable accommodation" and "undue hardship" actually mean? The answers to these questions, which are likely to form the basis of litigation for years to come, will derive from the many cases that will have to be considered individually.

It seems certain that the standard that will be adopted for accessibility by the government will be the forthcoming 1978 revision of the 17-year-old ANSI 117.1. Many shortcomings of the old standard will be rectified in the new revision, which will be approximately ten times longer and more prescriptive. However, it is anticipated that designers will be allowed to deviate from the standards in some cases, if an equally desirable or better solution can be demonstrated. While the old standard did not include residential buildings, the revision will detail accessibility specifications for both single and multi-family housing and related exterior spaces, and for mobile homes.

In the pages that follow, discussions outline not only the physical barriers built into the environment, but the social and psychological ones as well, which in their own way can be as restrictive to the handicapped individual as the physical barrier. In addition to these discussions, a number of finished buildings are presented that have been designed specifically for the handicapped. Because of the nature of these buildings, each represents an extreme example of designing for accessibility. Yet even with these extreme examples one sees proof that barrier-free design does not have to be a barrier to design. [David Morton]

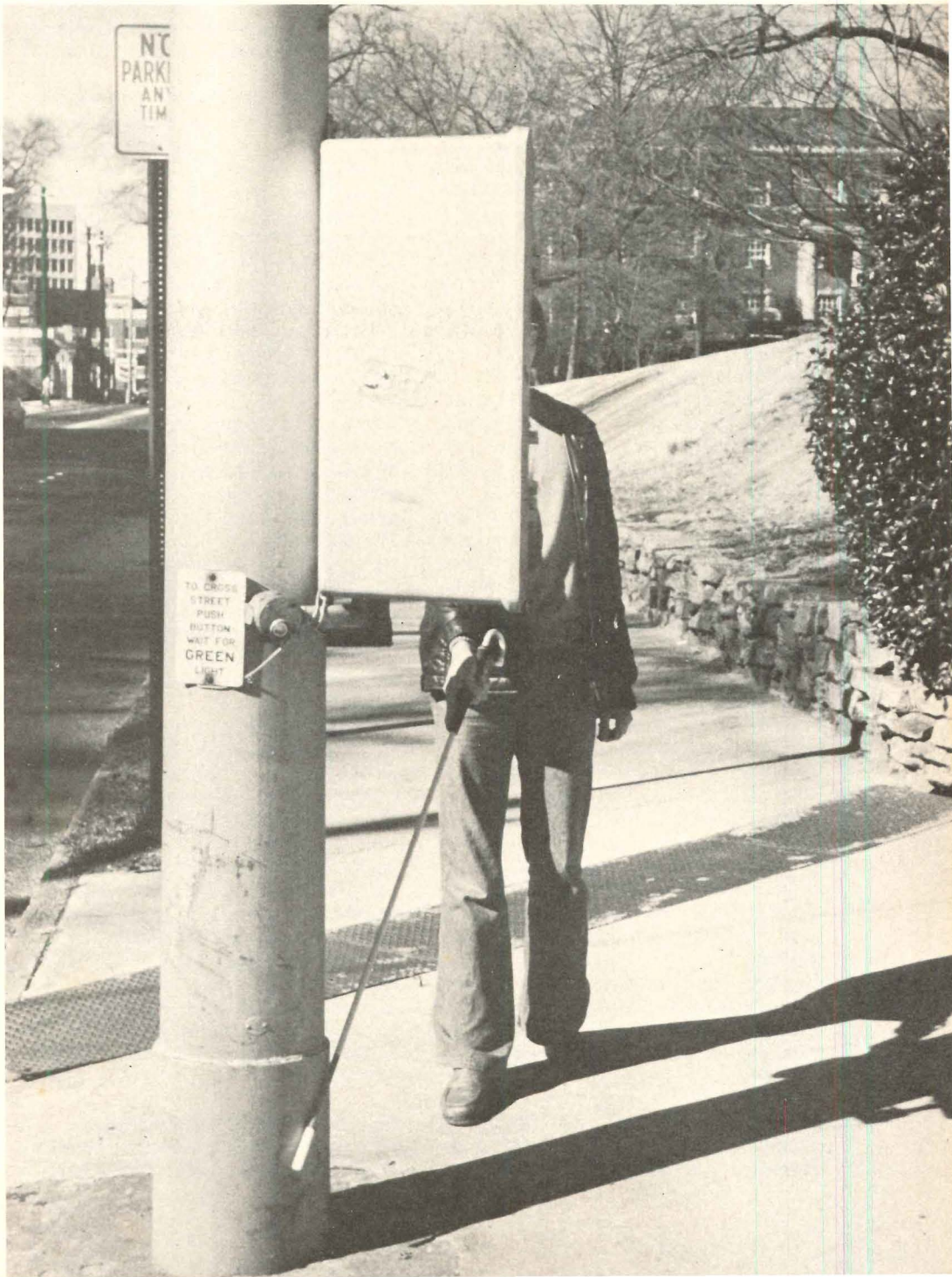
Barrier-free design

Design for access

Michael A. Jones
John H. Catlin

Dangers and hardships to handicapped are many; the familiar white cane used by the blind and partially sighted does not alert them to all of the hazards that abound in the built environment.

Photos: M.A. Jones or Capitol Development Board, Rehabilitation Institute of Chicago.



Environmental inaccessibility will affect everyone some time in life. The age-old problem is only now being confronted.

Why is the physical world the way it is? Early civilizations grew up along the rivers. They were subject to flooding and insect infestation, and so the communities chose elevated sites or artificially mounded the site to secure the attributes of elevated cities. Of course, they also afforded protection from attack. The highest point was usually taken by the power group, either the religious or secular. On fairly level sites, monumental buildings were built on artificial platforms to create the right impression of power. The impact of the acropolis on Athens, the castle on Heidelburg, and the abbey on Mont St. Michel is evident today. The same philosophy occurs in microcosm. In the cathedral the high altar was elevated above the choir, and the religious and secular were often separated by a grand change of level, as at Wells Cathedral where the stairs were designed and built with magnificent visual effect. This philosophy occurs today: witness Boston City Hall. Courses in architectural history and architectural design often result in the young mind being indoctrinated with the idea that even the most plebean building must contain at least one change in level to stimulate the user and achieve peer acceptance.

At the other end of the scale, a study of vernacular architecture will reveal functional reasons for changes in level, either to keep water or vermin out, to raise wooden floors above moist ground or to prevent them from rotting out. When the ground sloped, steps were the obvious solutions to the entrance as they took less

Authors: Michael A. Jones is Supervisor of Research and Design for the Illinois Capital Development Board, and also Research Architect for the Handicapped for the State of Illinois. John H. Catlin is Director of Access Chicago, a department of the Rehabilitation Institute of Chicago.

Landscape requires as much attention to needs of the handicapped as the built environment.

space than ramps. Intricate thresholds were developed to prevent rain from being blown under doors and to minimize the drafts that swirled around ankles. It is clear that students leave architectural school carrying with them excellent details for keeping buildings dry, plus a range of accepted ideas for creating spatially exciting structures. However, this arsenal of ideas and details has resulted in the development of an environment that requires people to change level by stepping up, down, or across vertical elements. Result: an environment inaccessible to many.

In recent years there has been a gathering momentum to integrate disabled people into the mainstream of society. Legislation at state and federal levels has been necessary to remove the discrimination against people considered "not normal." The disabled population, as a group, has less income, less education, less employment, and more poverty than most people. Legislation aimed at removing architectural (environmental) barriers from schools, businesses, and housing will afford the disabled the opportunity for the social and economic gains open to most citizens.

Sociological barriers: history

Historically, society had established norms, and those who did not conform were frequently ghettoized or dealt with most severely. Survival depended upon social cooperation and reliance on each other's abilities. This genetically programmed behavior of sharing resulted in a system in which productivity not only ensured basic survival but also, to some degree, a developing prosperity. Those who did not contribute to the common good could destroy the group. The programmed behavior of survival was so strong at times that families abandoned their newborn and elders. Even today the elderly are abandoned to nursing homes.

With the rise of civilization and the development of cities, "different" people continued to be relegated to institutions and ghettos, treated as outcasts, or put to death. In our enlightened times, the disabled person is still seen as a deviant whose role is clearly stereotyped.

Handicapped persons

The term "disabled" has been used so far instead of "handicapped" to characterize a person with impairment of mind or body. A handicapped person is someone who is prevented from attaining his maximum functional level because of environmental constraints. For example, a scientist confined to a wheelchair, working on the sixth floor of a laboratory, could perform as well as a nondisabled person at his job. If the fire alarm sounds, he becomes handicapped because all the elevators automatically return to the ground floor. His able-bodied companions are able to use the fire stairs. A young child traveling alone in an elevator becomes handicapped if it stops between two floors of a high-rise apartment and the emergency button or telephone is out of reach. In both examples it is the constraint imposed by the environment that has created the handicapping situation.

Most buildings, facilities, and equipment are designed for the average adult of average weight, height, stamina, agility, reaction time, eyesight, and hearing. However, from birth to death we are all faced with varying degrees of ability in motor development, communication, comprehension, and in the latter stages of life a possible reduction or loss of vision, hearing, and other senses that will affect our performances of everyday tasks. Temporary disability in the form of strained backs, broken legs, or some illnesses will also modify our actions.

It is estimated that nearly 60 percent of the population of the United States is mobility-impaired at any one point in time; that is, they are having problems with one or more elements of the built environment. The National Health Survey of HEW reported that in 1974 there were an estimated 29.3 million people of working age who reported that they were limited in their activities to some degree due to chronic illness and impairment. This is 14 percent of the noninstitutionalized population of this country.

It has been said that design need only incorporate basic criteria for accessibility for the blind, deaf, and persons using wheelchairs to result in environments that are suitable for all people. Superficially, this may appear correct. However, nothing could be further from the truth. For example, a person who suffers from visual impairment, but who is not totally blind, will usually rely on whatever degree of sight remains. Some such people with visual impairment have fallen off platforms between two rail cars when they mistake that space as the entrance to the vehicle. An audible cue at the doors could indicate their location.

New standards of accessibility

New and developing handicap standards at state and federal levels are much broader than earlier models, and they have brought cries of protest from within the construction professions as well as from without.

Critics state that standards go far beyond those which are reasonable. Requirements are extreme and unnecessary, and therefore will add extra expense to the building cost at a time when it can be ill afforded. Why should all this money be spent for the sake of one crippled employee, househunter, or student? The fact is that accessibility need not cost more money in new construction. The requirements for new buildings rarely demand special features. In fact, most of the items, details, and specifications can be found in any building throughout the United States.

The new standards incorporate the correct dimension or best device that can be used by the maximum number of people. Door knobs require grasping and twisting to open—a difficult task for many who have impaired upper limbs or hands. Levers require simple downward pressure. An imprecise hand movement can achieve this, as can an elbow or another part of the body, which could be so useful when carrying the groceries or a baby in one's arms, or when one has severe arthritis.

A 2′-8″ clear door opening provides adequate space for a person to maneuver in a wheelchair, but also is welcomed by the man moving in the new refrigerator. Accessibility benefits all people, and this is why the terms "handicap standards," "handicap requirements," or "handicap codes"—all having negative connotations—must be abandoned in favor of "accessibility standards, requirements, or codes," as they imply access for all people—an extremely positive attitude.

When accessibility is an integral part of design from its inception, the resulting design is rarely more expensive than it would otherwise be, and it is safe and usable by the vast majority of the population. Raising existing buildings to current standards is always more costly than if they were incorporated initially.

Consistent interpretation and enforcement mechanisms need development. Owners, engineers, and architects fear too rigid enforcement; disabled people fear too lax enforcement. Examples of both have occurred, and in many cases the aggrieved party has a case.

Environmental barriers: other facts

The term "architectural barriers" seems unfairly to place all the blame on the architectural profession, and this simply is not the case. "Environmental barriers" is a much more suitable term.

Equipment is often inaccessible, usually as the result of solving problems of crime and vandalism. Toilets in corporate buildings are locked to reduce the potential hiding place for terrorist bombs. Automatic vending equipment has short-lever operation to minimize the bending moment along its length, thereby thwarting the vandal, and small aperatures are de-

signed to prevent the thief from stealing goods or money. Because of the investment of time and money in the design change allied to the projected life of the equipment, the new problems remain for a considerable length of time. There must be a more comprehensive research carried out before a design is made final, and it must include human-factors engineering for more than average persons.

Human data on disabilities

If designers had a comprehensive understanding of the characteristics of human performance, it is doubtful that legislation guaranteeing the rights of access to disabled people would be necessary. A short, and therefore inadequate, summary of these characteristics may illustrate the knowledge needed to make more sensitive and thus more widely accepted design decisions.

Difficulty in walking

People who walk with difficulty, with or without a special aid, experience a range of problems. They may have reduced balance, agility, or speed of movement, or a combination of all three which contribute to their problems of mobility. The walking surface is critical to safe passage. Unevenness, raised joints, or debris can be hazardous. Very small vertical changes in level are particularly so, as they are not easily seen, and loss of balance, tripping, or falling usually result. Orthotics—bracing devices to strengthen or assist a part of the body—or prostheses, which replace missing parts of the body, may add to a semi-ambulatory persons predicament.

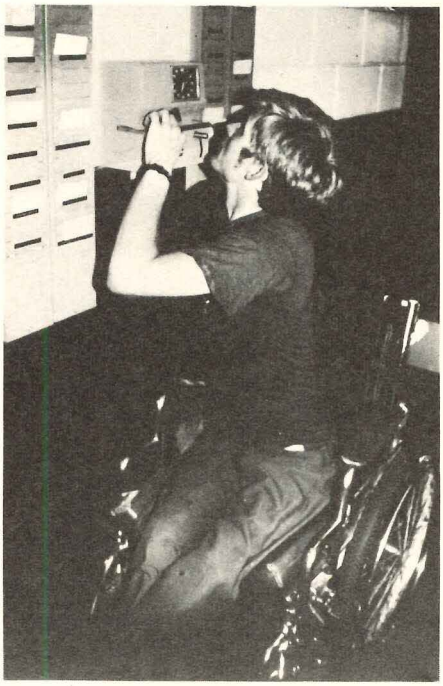
A person with a leg brace will have difficulty climbing a stair with a square nosing because his foot will tend to swing against the riser. The toe stops below the nosing and can only be removed with difficulty. If crutches are used, the difficulty is compounded. Descending stairs for such a person may have attendant problems. He may carry one crutch and use the handrails for support and balance and the other crutch to help descend the stairs. The failure of a handrail to extend beyond the bottom tread may make the last step dangerous. Exterior stairs without handrails are hazardous for people with crutches, particularly when wet or icy. While these problems may be obvious, some others are not.

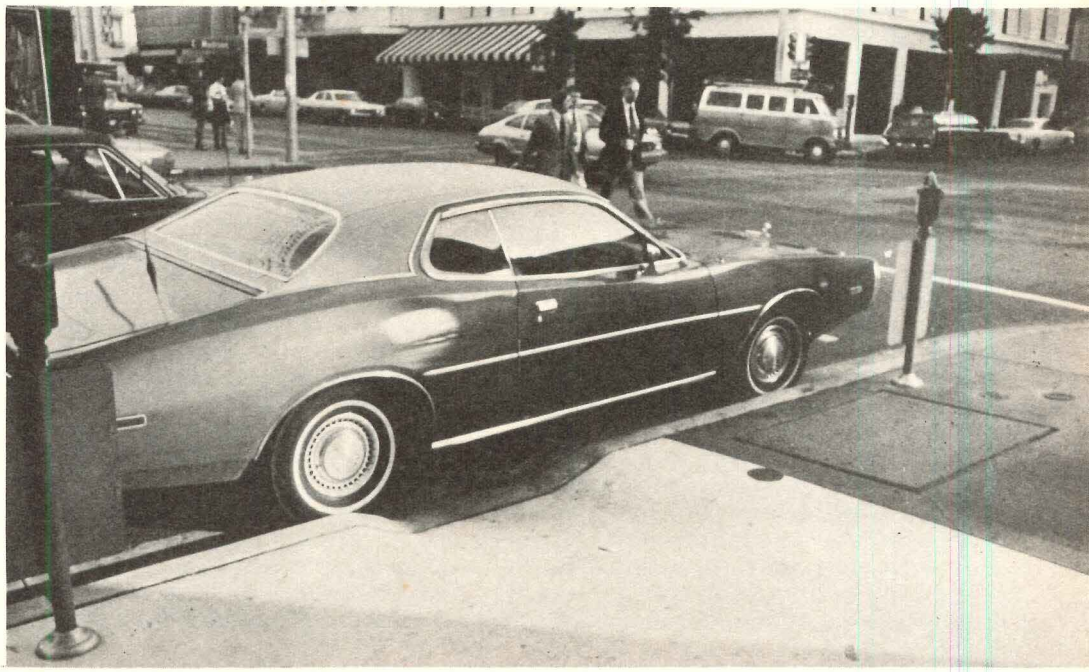
When opening heavy doors, the whole body is often employed to overcome their weight. Someone using crutches may have initial difficulty opening a door, but if it closes too quickly as he passes through, the bottom of the door may engage on the rubber crutch tip, and the crutch is trapped below the bottom of the door. If a step occurs at the door—which should never happen anywhere—the door is likely to close on the crutch itself, which results in a similar problem.

Wheelchair users

Wheelchair users have capabilities as varied as those of the ambulant population. Illness-related disability, congenital de-

Many accessibility problems are totally unnecessary. A grocery store scale, shelf, or cabinet should be within the reach of all (left). Other devices, such as punch clock (middle) could be lowered without affecting ambulant persons' use. Fences used at supermarkets to prevent theft of shopping carts often prevent access to those in wheelchairs (middle right). The legally parked car (note meter) blocks a curb ramp (bottom).





fects, and accidents affect all parts of the body, leaving limbs in various stages of weakness, paralysis, or absence. Persons without trunk balance are constantly beset with the problems of keeping upright in a chair. Reaching is always difficult, and one arm is usually used as a counterbalance, gripping the driving rim, armrest, or handle while the other performs the task at hand. Activities that require the use of both hands simultaneously, such as using the telephone, create a sense of frustration and dissatisfaction with the environment.

Paralysis not only affects motor control, but may also result in the portion of the body that is paralyzed being insensitive to external stimuli, such as touch, temperature, or even awareness of the position of the body. Injuries resulting from the sharp edges of screws projecting from lavatory supports, or burns from hot water pipes or drains below lavatories, may not be noticed until the person disrobes or sees blood on his or her clothes. The healing process is much longer in disabled than in able-bodied people.

Because of immobility, renal complications are the leading cause of death in paraplegics and quadraplegics. It is imperative that large amounts of fluid intake be made by these people throughout the day. Drinking fountains provide a major source of fluids available to the public and must be accessible to all people. They are more than a convenience to those who depend upon large volumes of fluid intake for their very existence.

The severely disabled with upper and lower limb involvement often use electrically powered wheelchairs. Controls of these wheelchairs are extremely light to the touch because of the limited movement of most of these people. Unfortunately, uneven surfaces can cause jolting, and the finger controlling the chair can be deflected to another button, causing eratic movement or sudden stops.

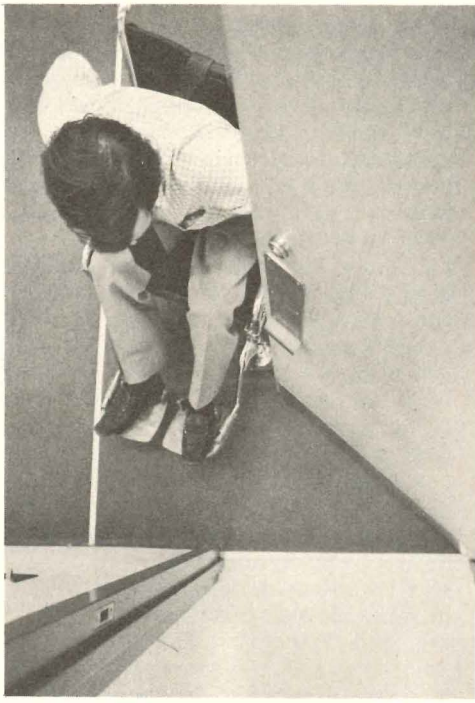
Wheelchairs vary in width from 1′-6½″ to 2′-8″, although those 2 ft to 2′-2″ are most common. Length also varies from 3′-6″ to 4 ft, and even then toes of very large people may extend farther. The seat is approximately 1′-7″ above ground, and the armrest 2′-5″ to 2′-6″ from the ground to the top of the rest. A person in a wheelchair can perform a turn of 180 degrees in a 5 ft to 5′-3″ diameter. Corridors with a width of 5 ft allow wheelchairs to pass. Corridors with a minimum width of 3 ft can be negotiated, including L-turns, but turns from a 3-ft-wide corridor into a 2′-8″ clear door opening cannot be accomplished. A corridor width of at least 3′-6″ is required for this maneuver. If doors open into the end of a corridor, a minimum corridor width of 4′-6″ is required. This allows 1′-6″ at the handle side of the door to permit the wheelchair to pass by the door. Although there appears to be ample tolerance allowed in the 2′-8″ door opening—from the face of the door in the open position to the face of the doorstop—a person wheeling through a doorway with a door opening towards him usually passes through at an angle, and so needs the width.

Narrow corridors are infrequently used in most buildings. But where they do occur, they often prevent access to a most important and necessary facility—the toilet. There seems to be an obsession with small lobbies with doors in series, modesty screens, and tight corridors to prevent "peeping into the john." They often result in the toilet's being inaccessible to those in wheelchairs. In many cases, the layout of the toilet room itself provides privacy, and the modesty feature is unnecessary. The situation is most serious in existing facilities where the removal of a wall would be expensive or impossible. The simplest solution is to eliminate the door, or one of the doors if they are a pair in series. There are many notable buildings that have been designed without doors to the toilet rooms—Dallas-Ft. Worth airport being an example. Corridors which are too narrow create a greater problem and usually result in a more expensive solution.

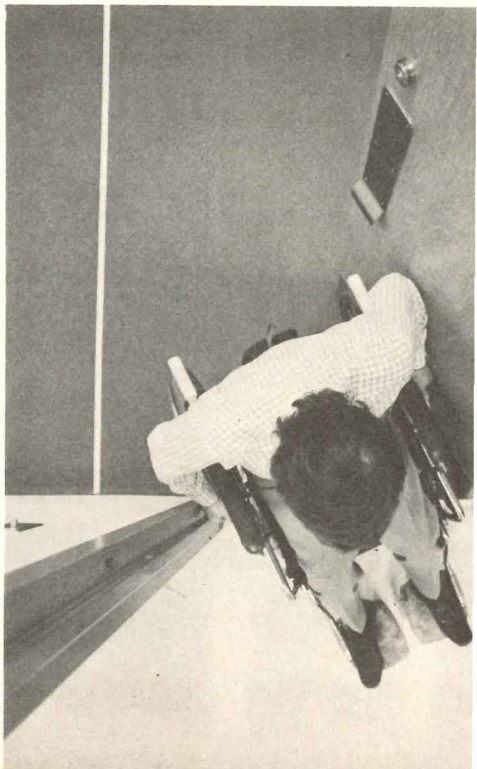
The size of the toilet stall is causing a minor controversy in some circles. The current ANSI A117.1 Standards require a 2′ x 4′-8″ stall, with handrails on either side, a door that swings out, and a toilet seat mounted 1′-8″ above the floor. There are people in wheelchairs who can function in this layout. Generally they are fairly strong, agile, or have been adequately trained. A 5′ x 5′ stall with a wall-mounted water closet located 1′-6″ from the side wall will accommodate the majority of those in wheelchairs who are not strong and who will never have the benefit of some of the training methods available. Grab-bars are a necessity and 1¼ in. to 1½ in. diameter will provide most people with a safe grip. The space between the wall and the grab-bar is critical, and 1½ in. must be adhered to. It must be remembered that if a person with paralysis or a balance problem slips, his arm may fall between the grab-bar and the wall. The whole weight of the body would then be taken on the trapped arm and a fracture could certainly result.

Reaching from a seated position is limited and depends on access to the location of the item being reached. If side approach to a telephone or vending machine is possible then the highest operable part of the equipment can be located 4′-6″ above the floor. If approach from the front is the only means of access, then the highest operable part should be no higher than 4 ft from the floor. Footrest projection, the inability of many people to lean forward in a chair because of lack of trunk balance, and the automatic lowering of the hand from the vertical side position to a forward diagonal position make the 4-ft dimension a necessity. Even this may be too high for some, and in toilet rooms, where sanitary provisions are of the highest priority, towel or tissue dispensers and other equipment must be located within 3′-4″ of the floor to the highest operable part of the device.

For "door-opening squeeze" at least 1′-6" is needed at handle side of door for wheelchair.



Although door is 2′-8" wide, knuckles can still get banged; also, door starts to close too early.



Upper limb impairment

The manipulation skills required to operate hardware and control devices often include grasping, pinching, twisting of the wrist, or a combination of actions. Frequently, the force necessary to operate devices or the small size of the controls increases the difficulty of operation. Inserting money into coin slots can be very difficult if the slot is designed for precise acceptance of the coin. The tollway coin basket is an excellent, if extreme, example of a good solution to this problem as it accepts coins thrown imprecisely from moving vehicles. Touch-type elevator buttons are often inadvertently activated when a person with jerky movement attempts to push the desired buttons. Knobs, buttons, and levers should be as large as possible, require light action for activation and must certainly not require multiple hand action to operate.

Persons with upper limb impairment or amputation may have trouble with balance. Where changes of level occur, handrails help such people, even though they may only provide support when leaned against.

Extremes of size and maturity

Persons with extremes of size and maturity have difficulty with the environment. But an extremely large number of able-bodied children below the age of 17 is also expected to perform in an environment designed, in the main, by adults, for able-bodied adults. In addition to their size limitations, their incomplete mental development may result in the occasional confusion or indecisive reaction to the built environment. Children are frequently placed in vulnerable situations, and their disproportionate representation in pedestrian accidents is ample indication of this situation.

Women may find that the environment becomes more hazardous during the latter months of pregnancy when their balance is affected. Bending is difficult, obstacles in walkways may not be seen, climbing stairs becomes tiring or hazardous as the normal center of gravity has been altered. Shortness of breath may occur and more frequent stops for rest may be necessary. If the environment was designed for the needs of all people, the needs of such women would already be accounted for.

Agility, stamina and reaction time

Those with cardiovascular and cardiopulmonary diseases, hypertension, and degenerative conditions, as well as many elderly people and people with multiple disabilities, have difficulty with agility, stamina, and reaction time. Many elements in the built environment require persons to make quick decisions or be strong and agile; examples include using revolving doors, escalators, and street crossings. The typical controlled street crossing requires citizens to be able to perform quickly at least ten complicated tasks.

In many cases, the time allowed for these tasks is based on the 50th percentile. Expressed another way, half the population does not have enough time to cross some streets safely. The environmental conditions, combined with their own physical characteristics, create difficulties that slow them down and, perhaps, place them in danger.

Time and space must be allowed for people who move slowly, and suitable rest areas should be provided with seating. There are cities with policies that reject seating in the downtown area because "winos" will sleep on it and upset the "upright" population, or leave visitors with a "bad impression of their fair city."

Problems of agility, stamina, and reaction time are not often seen and understood by the able-bodied population. Consequently, the needs of these people are rarely considered during design process.

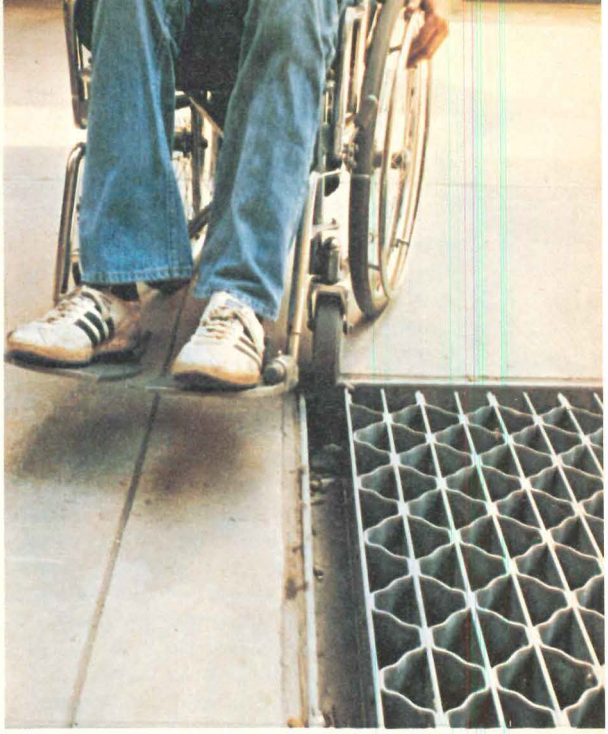
Hearing impairment

One of the major problems facing all deaf people is not that of their hearing loss, but a lack of public understanding of what deafness really is. The deaf person frequently lives in an isolation not penetrated by society even for the purpose of communicating life-saving emergency warnings. There are over 13 million deaf and hard-of-hearing people in the United States. The natural aging process affects all senses, including the gradual loss of hearing.

Appropriate signage in buildings and allied facilities is important for the auditory and speech impaired person. It is extremely difficult to get the hearing person to respond to a written message or question, or to listen attentively to a person with a speech impediment. Embarrassment or impatience usually results in the breakdown in communications. It is very difficult for anyone who does not suffer with hearing loss to imagine the difficulties and frustrations encountered by a deaf person endeavoring to locate a public toilet or the bus station. Clear, visual direction, predictably located, makes life much easier for these people. There are portable emergency warning systems available for deaf persons, which would provide hotels and similar facilities with an inexpensive method of providing warnings.

Sight impairment

The plight of the person with limited vision is rarely appreciated or understood. The totally blind person relies on a cane or a guide dog to aid him as he negotiates the environment, but the visually impaired struggles on with what little sight is left to him. Color and texture contrasts to the surfaces at hazardous locations provide warning and location cues. A stair with treads constructed with the same brick pavers as the sidewalk is hazardous because the change in level may not be visually obvious; the change in level may be slight and the lack of color contrast may make the path appear continuous, the stair nosings may be indistinguishable from the joints between the pavers, and sometimes exterior stairs with shallow risers and deep



Gratings are hazard for wheelchair and crutches.

Square nosings are dangerous to one on crutches.

Auto curb ramps (above) can cause wheelchair accidents (below) if not designed for that use.

treads are constructed with an absence of handrails which provide a potential visual cue for the sight-impaired. A color and texture contrast between the stair and walk would greatly improve the safety for all, but it would be particularly useful for those whose sight is limited.

Most designers are unaware of how the environment appears to people with low vision. Shadows may be hazardous because changes in level or projections cannot be perceived. Surface reflection may cause discomfort, signs cannot be distinguished, and colors are not clearly discernible and appear "washed-out." Under uneven light levels the elderly, visually impaired person may be more vulnerable to hazardous situations because the eye takes longer to adjust to the sudden changes in illumination. Diagrams and maps put up to help people find their way around often fail to help because of too small lettering or surface glare.

Blind people can negotiate most complex or confusing environments independently. They are taught to guide themselves to their destination by using a cognitive mapping process of landmarks and shorelines known more familiarly as blind location cues. Bus-stops, sign posts, driveways and changes in surface texture are learned so that a mental visualization of the route is made. A standardized system of blind location cues would be extremely difficult, if not impossible, to implement. However, worldwide research is being carried out in an endeavor to create the means for a safer environment for blind people. The familiar white cane, moved from a position outside of one shoulder to a point just outside the other and back again, can warn of hazards ahead only if they fall within this sweeping movement to a height of about 2′-3″ above the ground. Wall-hung water fountains, telephones, and signs located at head height cannot be detected and injuries about the face are not uncommon. These problems can be solved by creating a recess for the items, or continuing the projection to the floor or to within 8 in. of the floor. If the curb edge is used as a location cue, large radii corners can disorient the blind as it is difficult to determine when turning has been completed. A blind person detecting a curb ramp in an unfamiliar corner will have to make an assumption regarding the location of the ramp as several positions are used. Some ramps lead people directly into the pedestrian crossing (two per corner), and some corners are bisected by the ramp. The most inconsiderate locations are those which place ramps arbitrarily in the corner. The blind person may have to rely on traffic noise to indicate the direction he should take to cross the road.

Large plazas can also disorient a blind person and confuse him entirely unless there is some method of defining the major circulation routes, such as textured borders beside the walk.

Confusion and/or disorientation

The senile, the emotionally disturbed, the mentally ill, and the mentally retarded may have problems with the perception and interpretation of the environment. Anyone can be confused in new environments, particularly those that are poorly designed, or complicated, or which have inadequate signage systems.

Approximately 89 percent of the mentally retarded people are only mildly retarded, and are capable of learning to do productive work and live independently. Six percent are moderately retarded, but with training can care for themselves and become partially self-supporting.

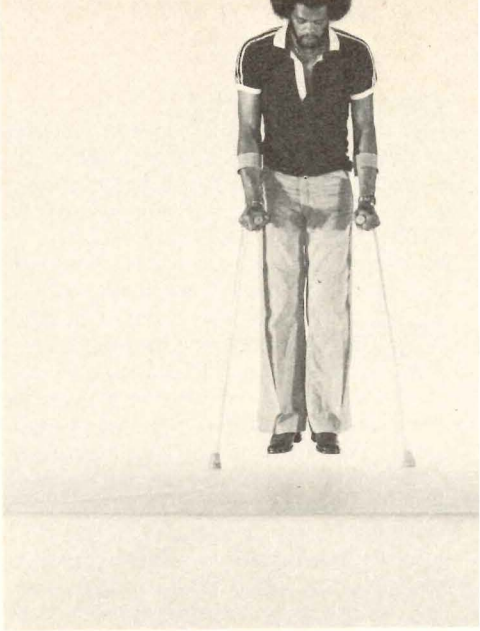
Buildings and facilities with long and circuitous circulation routes, such as airports, are difficult for those who are easily confused and disoriented, especially when retracing their route. Buildings with symmetrical plans are also confusing, especially when no attempt is made to distinguish different areas within the building. Some fear long and anonymous corridors with a constant repetition of doors, or are afraid of steep stairs. Cantilevered structures may also create a sense of fear in people and prevent them from using the building. People may not realize they are in a dangerous situation and will walk without due care across a dimly lit parking lot. Knowledge of the effects of the environment on mental health is comparatively new, but continuing research will bring a greater understanding of the psychological effects of the built environment.

Problems of inflexibility

People with severe arthritis, chronic back conditions, congenital deformities, those with orthotics, and those in casts may have difficulty bending, turning, sitting, kneeling, and rising. Conditions should be created that minimize the need for bending, or twisting. A person may have to twist in his chair to reach the control panel or see the floor position indicator in elevators with insufficient room for a wheelchair to turn. Change machines require a person to place his legs apart, bend his knees and trunk in order to reach the coin change slot. Chairs and benches with armrests to assist sitting and rising would be appreciated by many people and used. Tables with central pedestals are usually not as stable as those with corner legs for anyone who uses the edge front surface as an aid in rising. Others will use the toilet provided for the disabled because the grab-bars can be used when sitting and rising from the water closet.

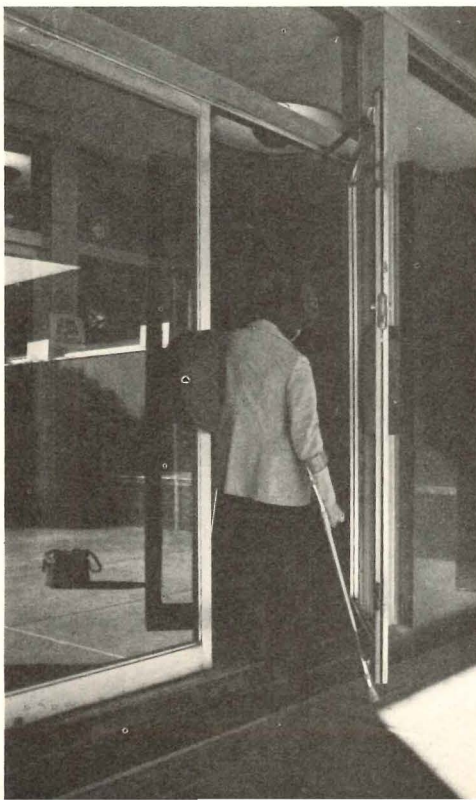
Incontinence

People with limited or no bladder and bowel control may be severely restricted to short journeys from home or to places where known public toilets exist. Often mugging or vandalism is cited as a reason for the nonprovision of these facilities in our cities and towns. The siting of such facilities so that they can be "policed" by the public can almost always reduce the incidence of crime.



In "swing-through" (above) all weight is on crutches, which is dangerous on slick floors.

A too-short handrail (above) presents obvious dangers, as does a step at the door (below).



Applying human data to design

All people assume an element of risk when they leave their homes. Designing an accessible environment does not guarantee total safety for any person; neither does it produce a "gray" uniform world as critics claim. Even when accessible features are incorporated, they are sometimes incorrectly located. Places for the disabled in parking garages are occasionally located on floors not served by the elevator. By simply restriping, the problem is solved, but this indicates the degree of awareness of some designers.

With knowledge of the characteristics of human performance, it is possible to minimize the possibility of designing a barrier for some person. For example, handrails on stairs are needed for a whole range of different purposes. They prevent anyone being bumped from falling off the stair. They also provide a support for people using the stair. This means that the design of the handrail should easily accept the natural opposing grip of most people, including those with arthritis. Those with amputation or other upper limb impairments also rely on handrails because their balance may be impaired. A 1½-in.-diameter handrail is ideal, though there are other profiles that are functionally acceptable. They are required at both sides of a stair to aid those who may have only one side of their body functioning adequately. Handrails serve as location cues for those whose sight is limited. A strong color contrast with the adjacent walls or surroundings will heighten the impact of the location cue. The handrail should extend beyond the top riser by at least 1 ft and below the bottom riser by at least 1 ft plus one tread width. This creates assistance for the blind and the semi-ambulatory person. The extension provides a tactile cue for the blind, both before commencing descent or ascent and on completion of the trip. Many semi-ambulatory people rely very heavily on the handrail, and particularly so when commencing and ending the trip. Exterior handrails of metal can become too hot to hold under intense summer skies so other materials should be investigated. Children and adults require different handrail heights and if both are users of the environment a rail at 2 ft and another at 2′-6″ to 2′-10″, measured vertically from the nosing, should be provided. They should be designed to take a load of at least 250 lbs at any point.

This example, only briefly summarized, indicates that elements in the environment serve a variety of purposes, some obvious, others less so. The greater the anticipation of problems of the user with these elements, the more "finely tuned" will be the resulting design.

Accessibility—are we going to do it?

Because of the immense number of existing buildings, those opposed to the ideas of accessibility state that, since little can be done to alter the situation, it should not be attempted to any great degree. If one considers what was done in the 19th Century by engineers, architects, planners, and other civic-minded people, it is obvious great changes can be effected. Economically, there is rarely the right time for these activities. They happen with vision and foresight. Accessibility is just another step in the right direction.

We can and will make the environment accessible, so that the rights of access, which most people take for granted, are extended to all. If this article hasn't convinced you, then maybe a selfish motive will. It is in your own interest to design for all people—you will probably become old one day. □

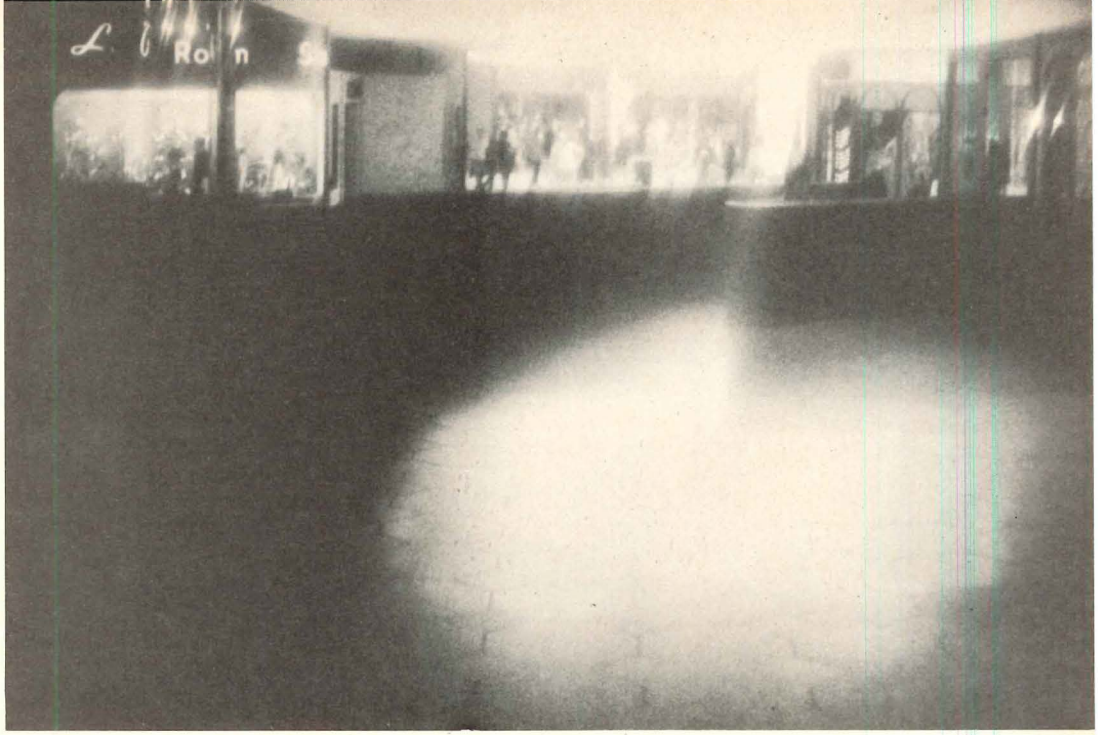
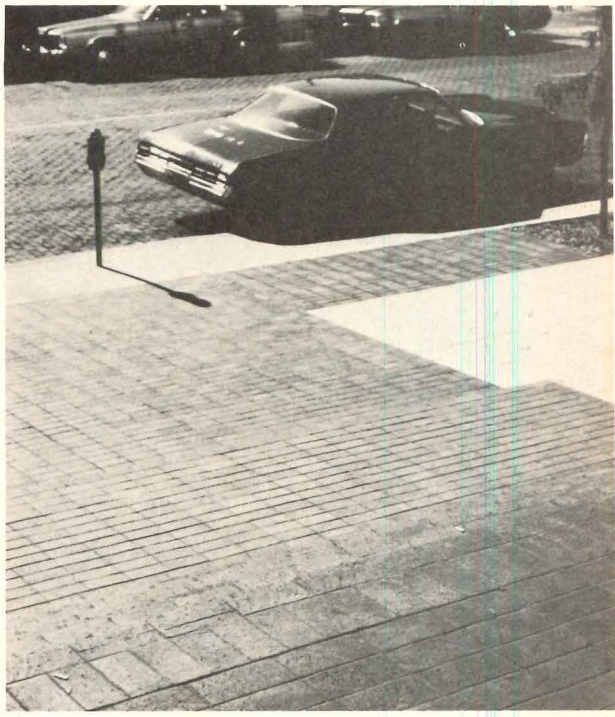
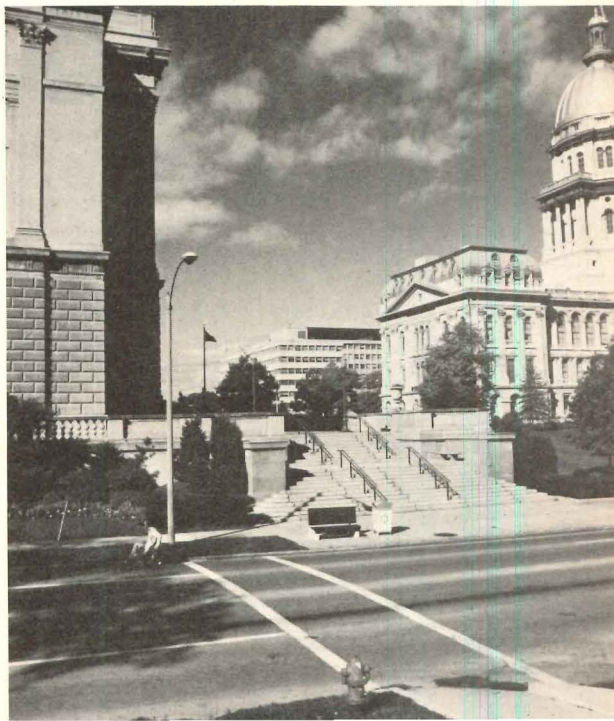


Photo: Dr. Leon A. Pastalan.

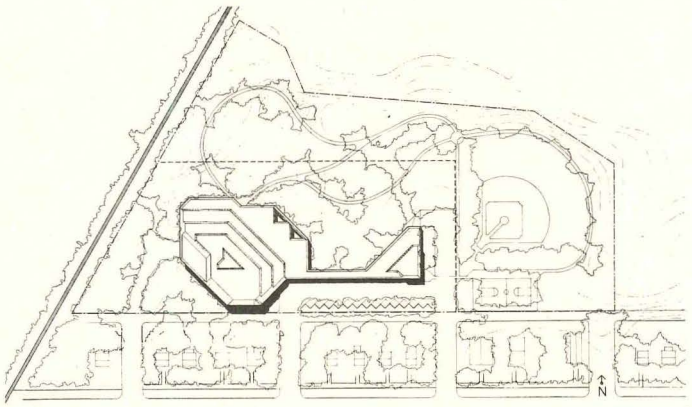




To the visually impaired, physical world is blurred and glaring (top). The toilet (above) meets most ANSI requirements but is still inaccessible. Use of one material on stairs (middle right) makes level change hard to see. Curb ramp at end of crosswalk (bottom right) was not deemed necessary at walk's other end.

Joseph E. Cole Recreation Center, Washington, DC

A place in which the soul can dance



SITE PLAN

America's first public recreation center for the retarded and handicapped is now a magnet for therapists and architects. Kent Cooper's and William Lecky's design in our nation's capital is proving that barrier-free design has come of age.

Of all disabilities, mental retardation is by far the hardest to imagine for those not afflicted by it. Those of us who can see can blindfold ourselves, those of us who can hear can stuff our ears with cotton wool, those of us who can walk can roll ourselves about in wheelchairs. But how can one conceive—let alone simulate—what it is like to be retarded? Therefore, much of the architectural profession's planning for the needs of the mentally retarded has been based, of necessity, on observation alone. Institutions and schools for the retarded have existed for some time in this country, but save for one private facility in San Francisco, there had never been a public recreation center for the retarded and handicapped before the Joseph H. Cole Recreation Center opened last year in the Anacostia section of Washington, DC.

This building's significance lies not merely in its pioneering place in one municipal government's efforts to improve the lives of some of its most irredeemably deprived citizens, but also in that it should—indeed *must*—be studied by any architect involved in planning a similar facility. That imperative is clear enough if only in the uniqueness of this building and its program. But beyond that, the Cole Recreation Center is a virtual textbook for most of the issues inherent in barrier-free design, issues not limited to the specific disabilities to which many other buildings for the handicapped are confined.

The barriers implied in the phrase "barrier-free design" are generally, and not incorrectly, understood to be physical. But the psychological barriers most people have in approaching the subject are often just as much of a handicap as physical disabilities are to the handicapped. Perhaps that is why it has taken so astonishingly long for a building such

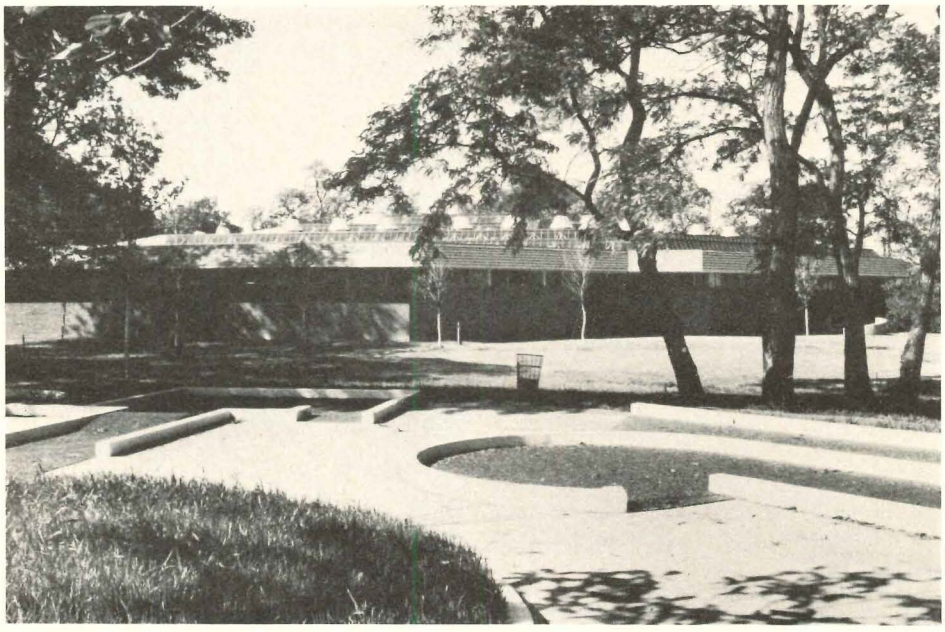


Photo: William Lecky

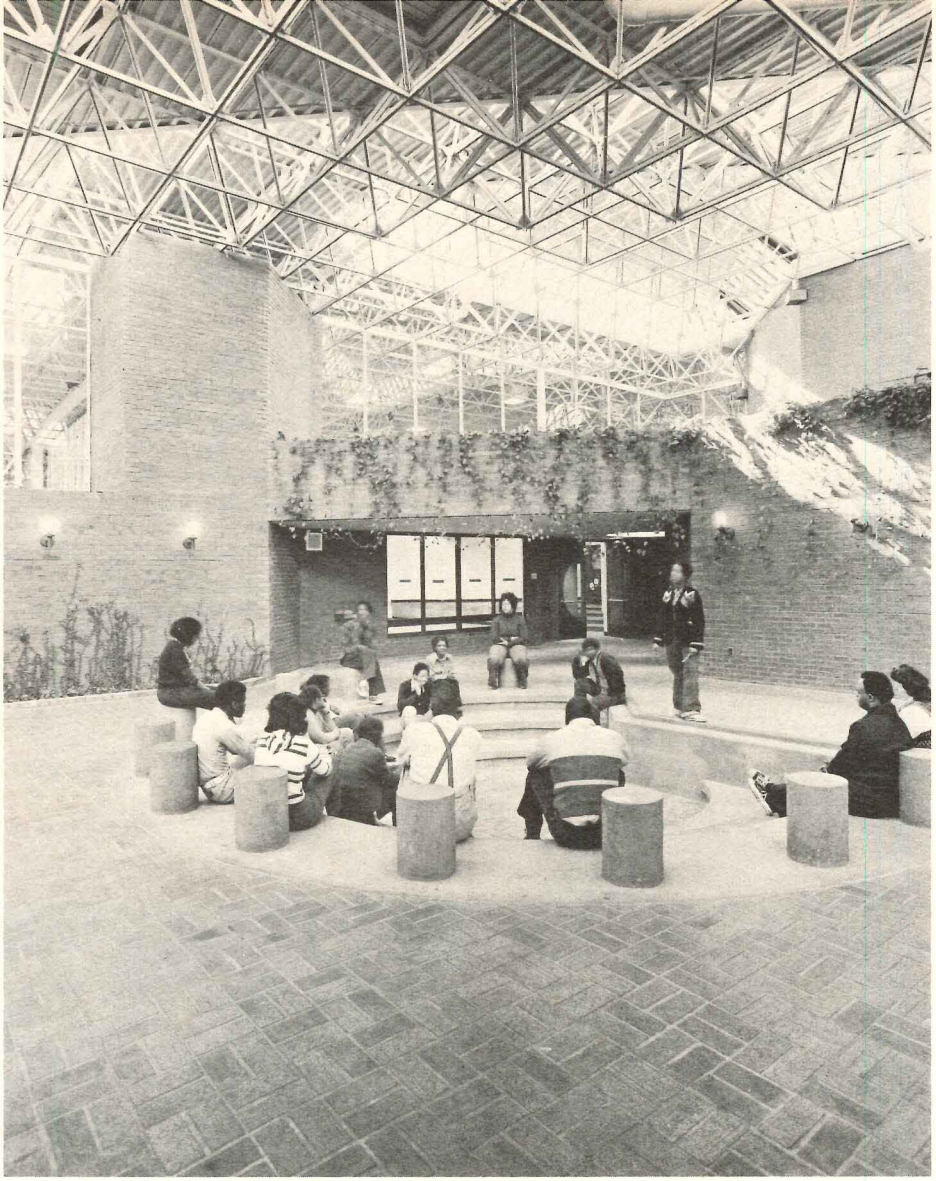
Exterior of center (above) with overhanging roof that protects arriving and departing users (below)

as this to have come along, and for just that reason the conception, execution, and successful operation of this inspiring project bring honor to all those involved in it.

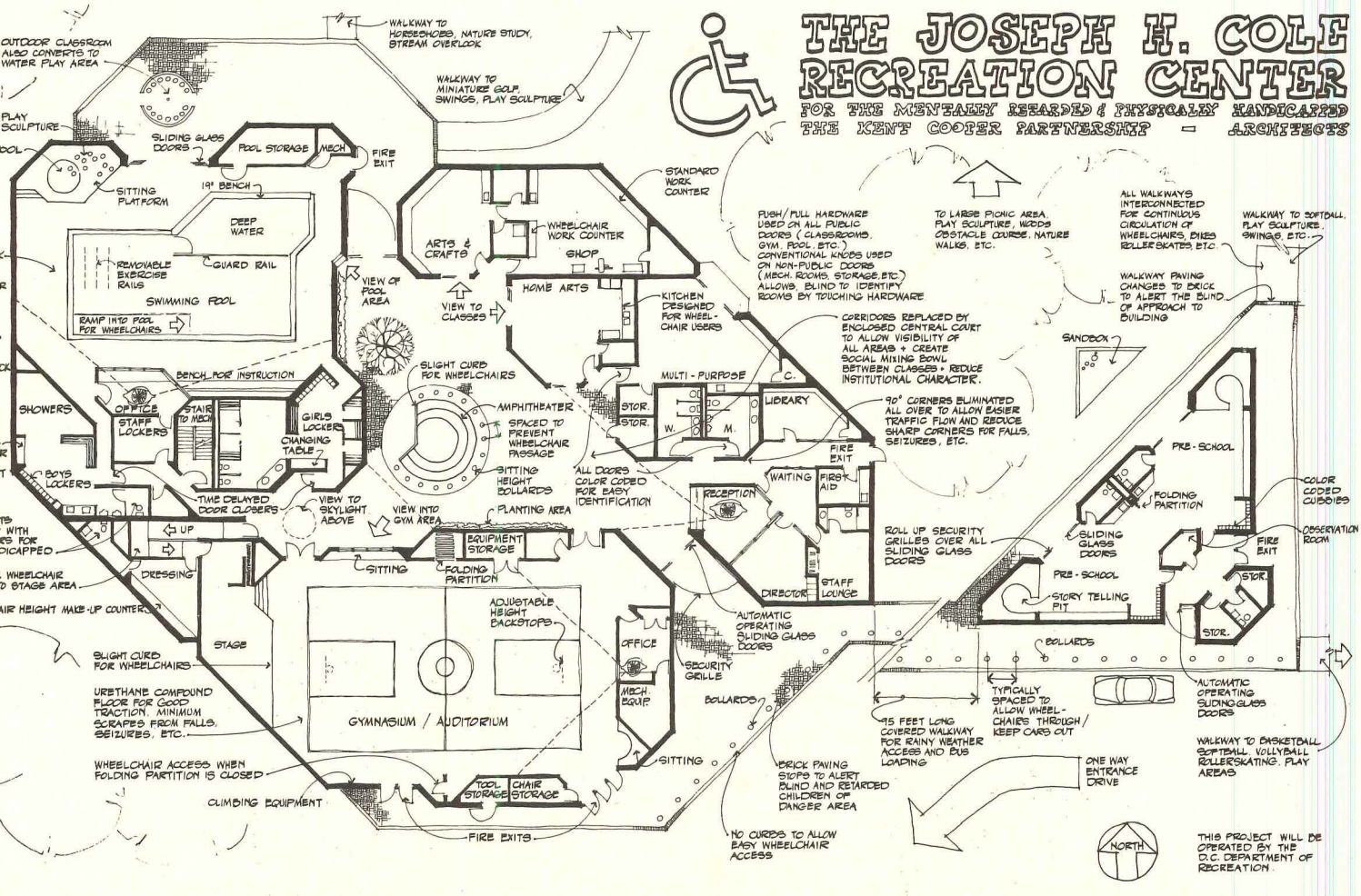
Good neighbor policy

Kent Cooper and William Lecky had previously worked on a variety of building types for the District of Columbia government, so when they were commissioned by the city to design a therapeutic recreation center for the retarded and handicapped, they were no strangers to some of the basic requirements for municipal construction in the nation's capital. At the top of the city's list of priorities was the need for the structure to be secure, Washington having one of the highest vandalism rates in the country. Therefore a minimum of exposed entrances and windows, a maximum of durable materials were necessary, and thus far the center has enjoyed that paradoxical reprieve that sometimes is granted when a thoughtfully designed building is placed in an area with no previous indications of respect for public property. The architects wanted this building to relate to the black working class community around it, and they correctly gauged the potential fear and suspicion that the introduction of a facility such as this could evoke in a residential neighborhood.

Accordingly, they devised a number of design solutions to accommodate and circumvent that anticipated community hostility. Cooper and Lecky planned the center's exterior to look as noninstitutional as possible. This they achieved by several



Courtyard with amphitheater (above), architects' plan (below) with barrier-free conceptions.



means in reducing the visual bulk of the structure. Among them were separating the center's day care facility into a smaller, adjacent pavilion, employing an angled plan that succeeds in cutting the building's mass, using recessive masonry cladding that lets the center blend in with the city park in which it is sited, and designing a deeply overhanging roof that further emphasizes the horizontal, domestic scale. (That overhang also serves as protection from the elements for those users who must be helped to and from vehicles and wheelchairs as they arrive at and leave the center.) Picnic tables that existed at this favorite neighborhood outing spot were kept intact, and a row of dilapidated abandoned houses adjacent to the center will soon be demolished to establish an open, landscaped link to the nearby streets.

So successful were the architects' efforts toward those ends that neighborhood residents who have visited the center have expressed astonishment that the building is actually so much larger on the inside than it seems on the outside. The general look of the Cole Recreation Center is not unlike a late copy of one of Frank Lloyd Wright's Usonian houses, not a startlingly innovative image, but one that serves the architects' purposes well. The 3-ft-high clerestory strip windows conform to the city's security requirements (as do the rollaway steel gates and roll-down steel tambour shutters that protect ground-level glass sliding doors), but a fortresslike feeling is happily avoided.

Heart of lightness

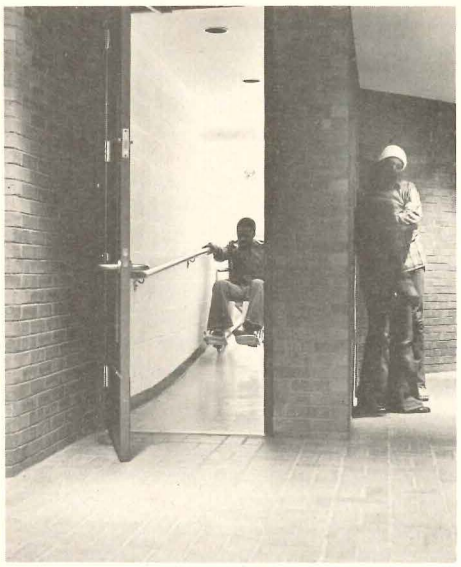
The interior does indeed come as a surprise after an examination of the exterior. A large central courtyard is dramatically topped by a structural space frame that proved to be a major contributing factor to the flexibility of the plan. Without that flexibility an architect is severely limited from the start in designing for the handicapped: for structural expediency is frequently the most serious obstacle to freedom of circulation. Here, the interplay of structural necessity and programmatic need was significantly enhanced by the use of this computer-designed structural system. And, in combination with skylights and the aforementioned clerestory windows, the space frame gives a feeling of lightness and loftiness that is at once comforting and uplifting.

The courtyard performs the first of a sequence of acclimating functions that make the interior spaces of this building seem as homelike as the exterior leads one to believe. Carefully considered sight lines make it possible for the visitor to catch glimpses of the various activities going on in the spaces clustered around the central atrium. Since fear of unknown spaces is a special problem for the mentally retarded, this gradual revelation of what comes next is of great help in easing them from the reception area into the specific activity rooms. Sometimes, the transition is too great to be made in one step, so the architects have thoughtfully included several nichelike withdrawing areas into which the wary user can retreat until ready to face further exposure.

Little things mean a lot

Much of the designers' efforts, of course, were directed toward circulation, for while the center is used by the retarded, it is also open to the physically handicapped as well. Every conceivable detail of the building was evaluated for the different needs of both sets of users. Cooper and Lecky drew up a set of 18 design criteria, which ranged from steps (there are none except in mechanical areas) to hardware (push/pull bars, few knobs, automatic door closers on major entrances), from paving textures (varying to cue position for the blind) to color coding (enabling retarded users who can neither read nor count to "go to the blue door.")

There were literally hundreds of small,

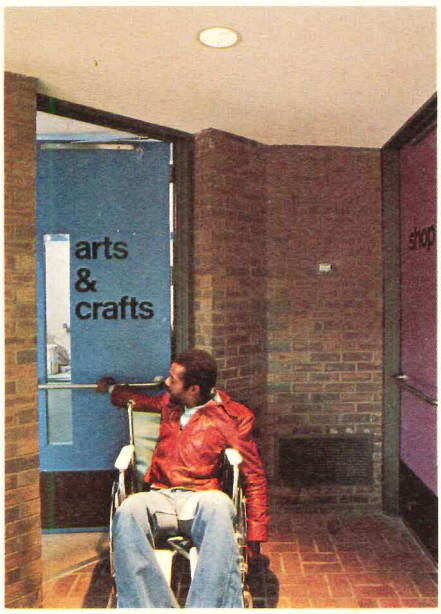


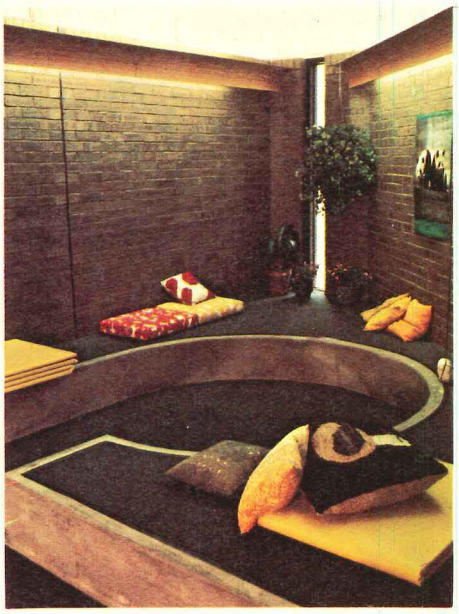
Wheelchair access to pool (above) is aided by inclined ramps. Pool (below) has ramp enabling wheelchairs to go directly into it, and railings for special physical therapy activities.

but extremely important, details that were so thoroughly worked out to anticipate every possible contingency that one feels the human presence behind this design far more palpably than in the vast majority of architectural design being done today. The swimming pool, the center's justifiable pride and joy, demonstrates the depth of attention given to this true example of total design. Since a great many of the center's users are confined to wheelchairs, a ramp was included to allow direct access into the pool for those vehicles. A common barrier to those in wheelchairs is the too-steep ramp, but this barrier becomes a hazard in a pool, where a steep incline could cause a paraplegic to roll, helpless, into water over his head. An easy 6-in. slope prevents that from happening.

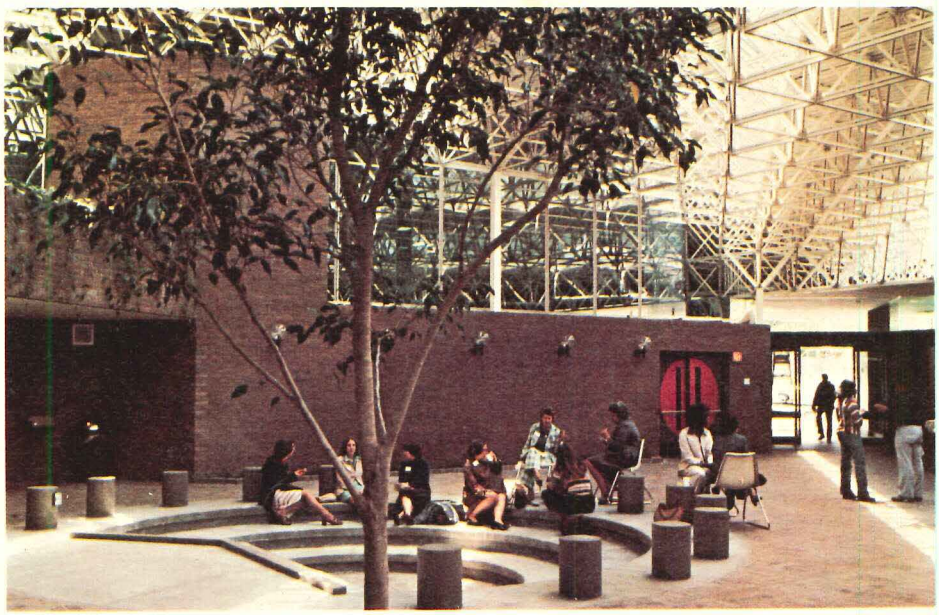
Adjustable railings in the pool allow the pool to be used for physical therapy, and underwater railings demarcate areas of the pool used for special training. Around the pool's perimeter a wide wooden bench permits wheelchair transfers to be made in cases where the chair itself need not be taken into the pool, and the deck that surrounds it is slightly inclined to minimize water retention, and thereby reduces slippage and skidding.

A sense of community is promoted at every turn at the center. Kent Cooper and William Lecky correctly felt that the one abnormality most frequently imposed by society on the retarded and the handicapped is that of isolation. The architects here have provided a place where people can reach beyond what other people see as their limited potential, but which they themselves experience as limited opportunity for the most basic of human impulses. This is a small, but very significant, beginning toward giving these people what is no more than their due, and no less than our duty. [Martin Filler]





Push/pull bars (above left) permit wheelchair users maximum independence in passing through doorways. Nook in day care center (above right) is one of several "retreat spaces." Day care classroom (below) has glass sliding doors leading to park outside. Central courtyard (bottom) has floor texture change from brick to concrete to cue blind to conversation pit.



Photos except top left: William Lecky

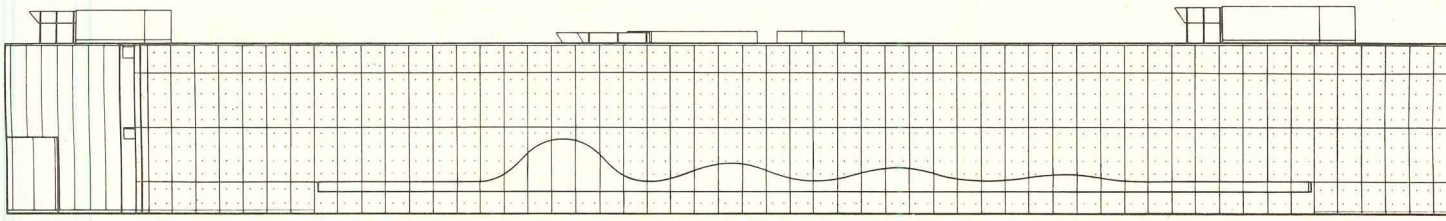
Data

Project: Joseph E. Cole Recreation Center, Washington, DC.
Architects: The Kent Cooper Partnership (now The Cooper-Lecky Partnership). Rob Byrnes, Job captain.
Contractor: George C. Martin, Inc.
Program: municipal recreation center for the mentally retarded and handicapped, providing physical therapy, athletic, arts and crafts, and domestic skills facilities, and a day care center for preschool age children.
Site: a small, wooded public park in a low-rise, urban residential neighborhood.
Structural system: steel frame construction, metal space frame and steel joist roof.
Mechanical system: unit ventilators, chillers, and heaters.
Major materials: brick masonry exterior walls, brick masonry and mortar interior walls, concrete and brick floors, acoustic tile ceilings. (See building materials, p. 134.)
Consultant: KCE Structural Engineers.
Client: DC Department of Recreation.
Cost: approximately $2.3 million for construction and site work.
Photography: Robert Lautman, except as noted.

Illinois Regional Library, Chicago

Fanciful and functional

Nory Miller



A library for the blind and physically disabled represents an inventive response by Stanley Tigerman to design problems of a social and formal nature.

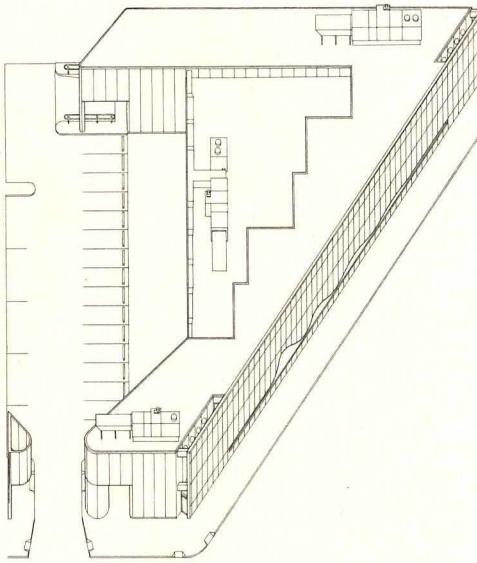
Stanley Tigerman—*enfant terrible* of the Midwest—has had a career full of transitions. He has moved from Walter Netsch to Paul Rudolph to Harry Weese to Mies van der Rohe to Piet Mondrian, pop art, and Art Deco; from the utopian Instant City to concerned public housing, speculative private housing, and chic, kicky houses. He is now the seasoned guerrilla leader of a "there is more to life than less" movement in Chicago and that city's representative to contemporary symposiums on architecture.

Over the past two years or so, there has been a pronounced shift in his architecture. Lines that once were straight are now curved; black and white has become technicolor; and multiple inversions of perceptual logic have appeared. It is his particular brand of non-modernism, neither "white" nor "gray" really, nor even thoroughly "post." His own description is that he is making "architecture couched in humor, architecture that is fun. Humor, human," he says, "the words even work together."

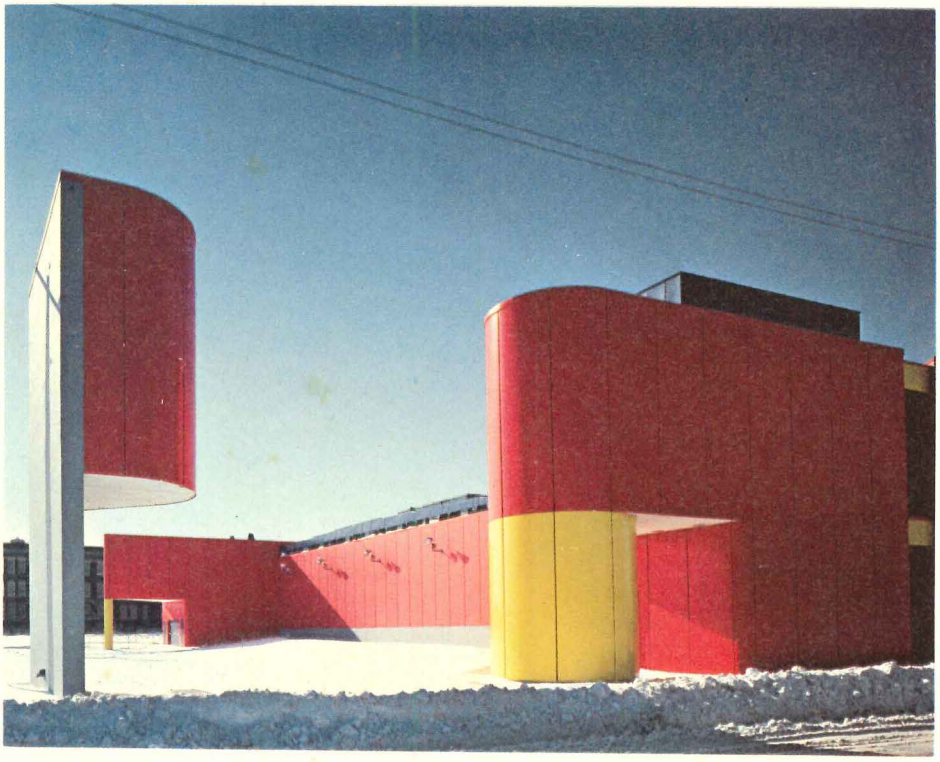
The very best of these new buildings, and the only one completed, is the Illinois Regional Library for the Blind and Physically Handicapped and Community Library in Chicago, which opened in February. It is an ambitious design that manages to be particularly sensitive to the needs of its patrons, intelligently sited with provisions for expansion, under budget, and also Tigerman's current architectural manifesto.

Remarkably, all this takes place in a tight-budgeted ($1.9 million), tight-sited, tight-programmed government building, subject to a full range of OSHA regulations, in which Tigerman was the designing consultant to the official architect, the City of Chicago's Bureau of Architecture (Jerome R. Butler Jr., City Architect).

The library serves three functions: it is the State of Illinois's distribution center (essentially a post office) for books and cassettes for the handicapped; Chicago's public library for the blind and those in wheelchairs; and a small branch library for its inner-city community. By the time Tigerman was hired, the program was set and a small triangular site on Chicago's Near West Side was purchased. Tigerman located the building on two sides of the triangle, left the third for grade-level parking, and left a one-bay-wide hole for future stack expansion. The last was accomplished by subdividing the library's two-story height into three levels of stacks, which were arranged to be split-level to the rest of the building.

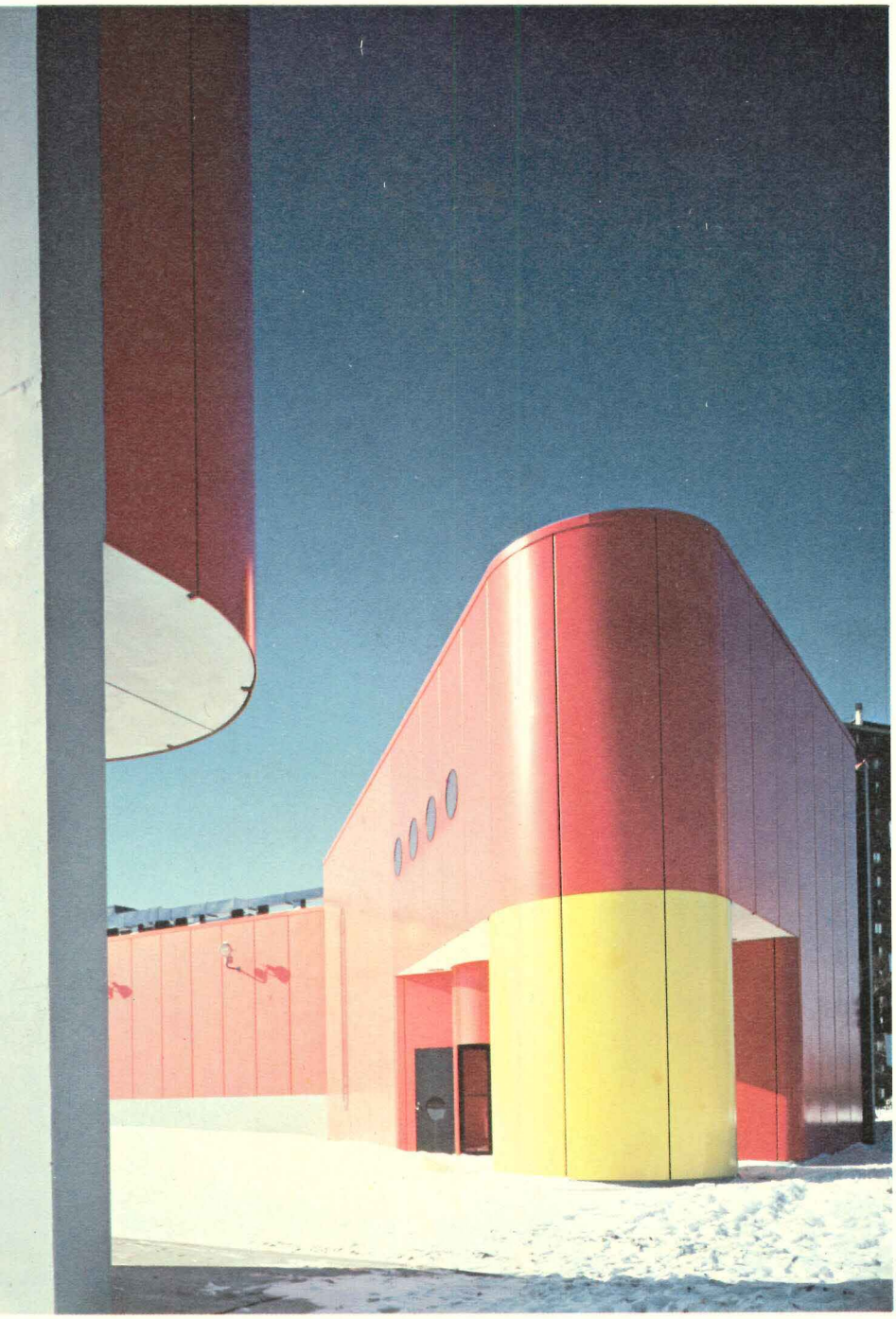


Freestanding element and curved corner mark entry for parking.



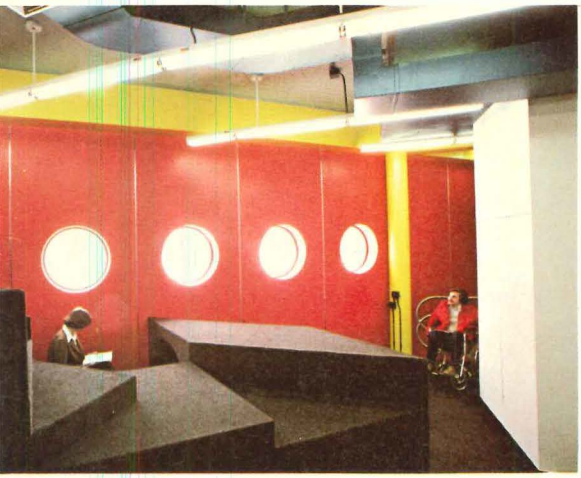
Author: Nory Miller, formerly managing editor of *Inland Architect* in Chicago, has recently joined *AIA Journal*.

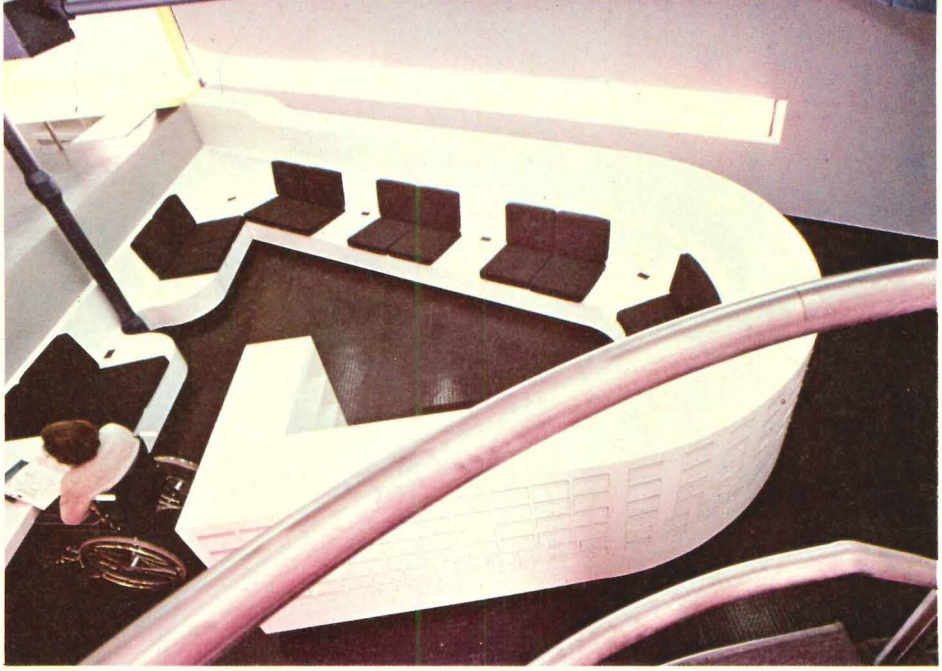
Poured concrete wall acts as a beam to span 165-ft-long butt-jointed window, elsewhere. Panels on exterior of building are baked enamel.



Visitors enter main door behind curved corner (left); inside, corridor for blind is edged by "tactile" service counter (below), counters curve in staff lounge (above).

Illinois Regional Library





Community library has areas for pre-school (above, left); braille card catalogue (above, right); meeting room (below, left); area for children (below, right).

Circulation takes precedence

Inside, Tigerman eschewed a belief in the value of flexible, universal space to design a totally specific, highly successful building around three basic principles. First, the plan is linear because a linear plan can be followed and memorized more easily without sight. Second, all furniture is built-in so it can be learned and avoided. Third, everything is soft-cornered to reduce the hazard from collision. All of which allowed Tigerman to indulge his long-time adherence to meticulous detailing and his newfound fascination with curves.

The focus of the interior is an undulating circulation counter. It sweeps the entire length of the building from the entrance to the building to the entrance to the second floor. It is not only counter but handrail, 54 in. high, signaling with each dip and inner bend the presence of a staff person. The deepest dip signals the checkout desk. A third cutaway underneath the counter permits people in wheelchairs to move out of the circulation path. Upon entering, the first thing a blind person (or anyone else) comes to is a staffed control desk. Here he can be directed to the right to the volunteer reading room, left to the lounge with plug-in monitors for cassettes, or to the Braille catalog and circulation counter beyond.

The card catalog is unique. Tigerman worked closely with the American Federation of the Blind in developing the catalog as well as on other design elements in the building. Behind the counter, stacks are closed, since Braille books are organized in a special order.

On the second floor, Tigerman has woven—into the spaces not occupied by stacks—a community branch library and a variety of staff functions, interlocked like a curvilinear Chinese puzzle. It is full of Tigerman pranks such as a pre-school carpeted "environment" shot through with dark tunnels "in which only the blind children can read" and a tiny staff lounge handsomely subdivided into different level seating areas "to accommodate feuds."

The branch library's overly zealous single-use zoning program, separating adults, teens, children and pre-schoolers, is nonetheless thoughtfully served by built-in banquettes backed by table-height counters and chairs.

There are a few odd moments: a wall that suddenly breaks into undulations to meet a requirement for minimum corridor width, squeezed from the other side by columns. The rumpled wall apparently performs acoustical tasks for the auditorium it edges, a serendipitous result, but does look like a not-yet-attended found object.

On the whole, the interior is taut, restrained, more than serviceable, and, as Tigerman says, "on the dime."

Putting up a front

The exterior combines two formal ideas, the 20th-Century building as machine and the pre-modern wall as two-dimensional façade. The machine is enclosed in bright red metal panels, its bones celebrated in yellow and its entrails (conduits, ducts, roof units) dancing about in blue. It has portholes instead of windows, with the sea-going metaphor continued briefly inside by the design of the railings.

The façade is the long hypotenuse of the triangular building, facing a major street. It is one very long, very heavy concrete pour, painted gray and pierced by a 165-ft undulating window. The window is Tigerman's willful act of irrationality "Blindness is irrational, as is the window," he says with a logic that would make sense only on the other side of the looking glass.

Then in a true spirit of multivalence, Tigerman also explains the window as: 1) a cardiac arrest on an EEG; 2) a gun pointed at Walter Netsch's head (Netsch, once his mentor, designed Circle Campus which sits cater-cornered to the library); 3) a special window to be looked out of by those in wheelchairs, hence the low height, or by staff members, hence the periodic bulges; and 4) a tilted table-top version of the adjacent corridor configuration. "Architects," he says, "have been painting structure on elevations for years, I've painted circulation."

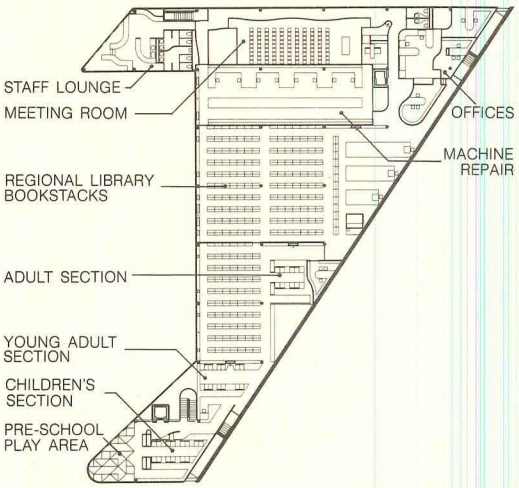
The last, truly an iconoclastic statement in the land of structural expressionism where he practices, is just one more witty stand, as he recently admitted. Just as one suspected, Tigerman drew the frolicking line first, liked it, and later reflected it in the plan and elevation of the circulation counter.

The form that was so pleasing to his eye is a familiar one—John Hejduk's cloud cut-out in the Barbar House; Michael Graves's celestial soffit; ultimately late cubism, especially Matisse's gouaches.

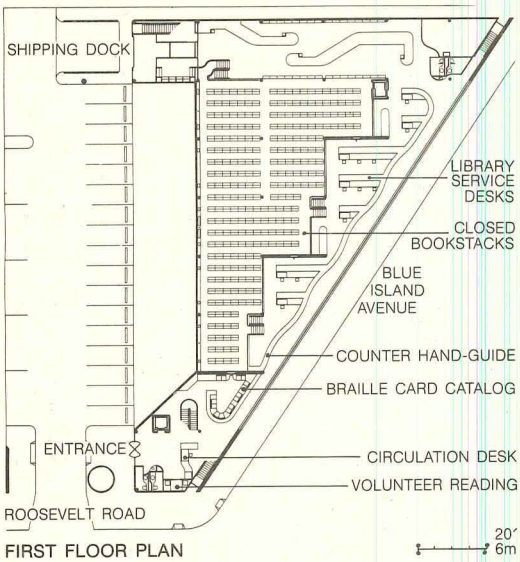
Not surprisingly, the window has become the building's logo, appearing as the shape of signs, on stationery, and the rest. For the window is not a symbol of something, but the equivalent of applied ornament, which is symbolic in its own way. Significantly, though, the butt-glazed light motif is not applied but inserted, literally forcing the top of the solid concrete wall to behave as a beam. It is indeed willful.

Ornament is also invoked by the brightly colored pipes, braces, and wires running in and around the building. But here it is a high-tech happening, even system-coded as in a factory, and with no distinction between inside and outside.

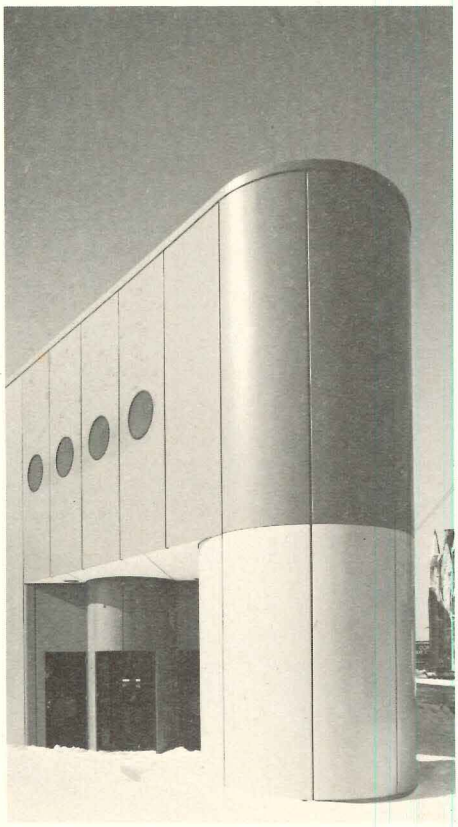
While the pipes tell us what they are in a matter-of-fact manner as if this were something we needed to know—a cliché as widespread in nonindustrial as well as industrial buildings these days, albeit here interestingly limited to a Mondrian palette—the waving window tells us nothing at all. At least, nothing a passerby could be expected to understand. It does not say anything about the kind of building this is or the functions inside as might a Beaux-Arts design element. It is not communicative of man's place in nature or "the scheme of things," as Hejduk's and Graves's cloud images might be interpreted. It is simply there—berserk Beaux-Arts—thumbing its nose at gravity and



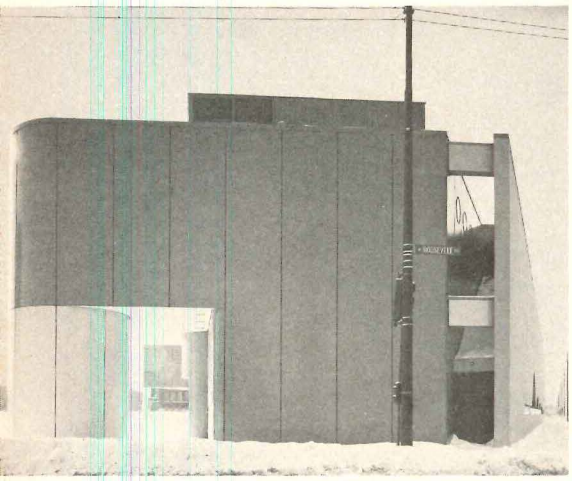
SECOND FLOOR PLAN

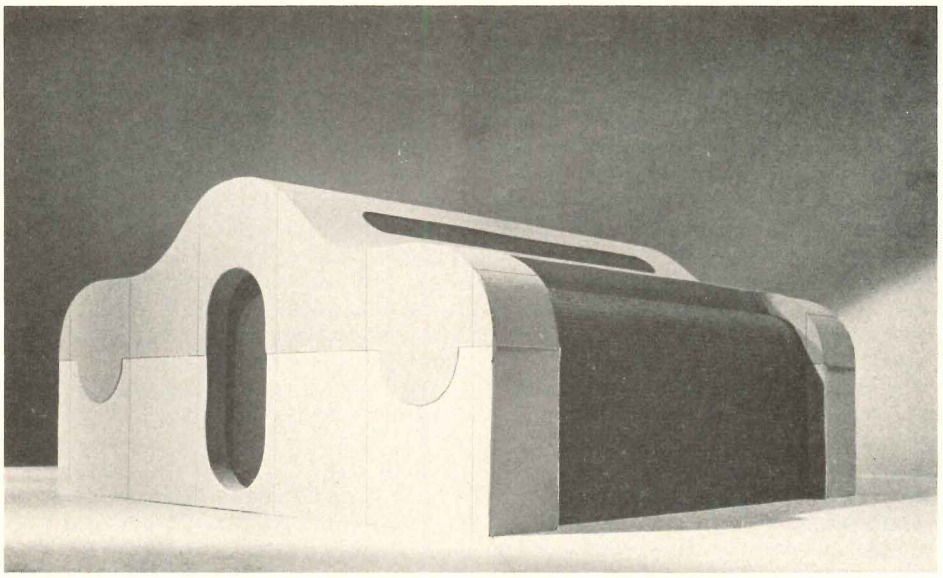


FIRST FLOOR PLAN

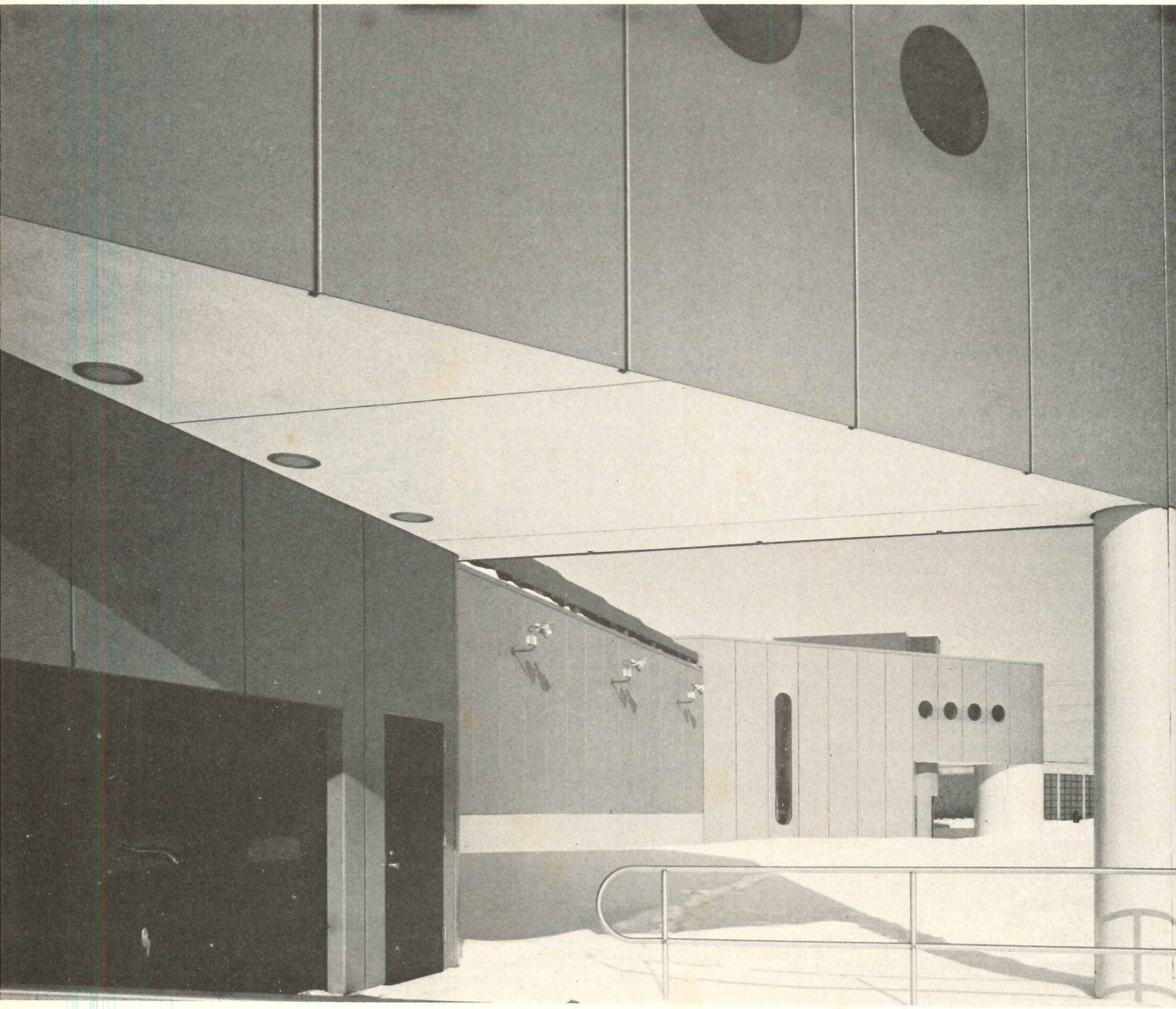


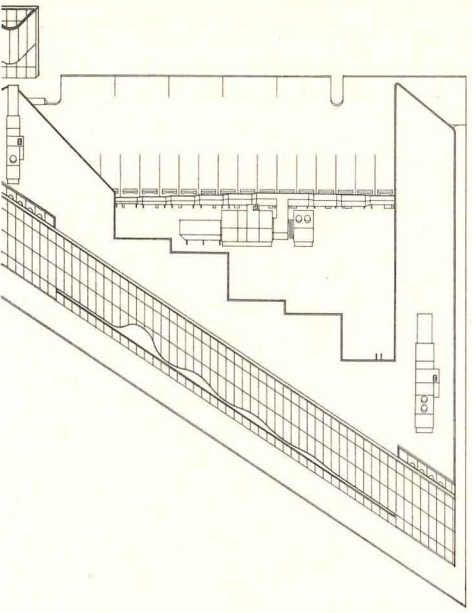
Illinois Regional Library

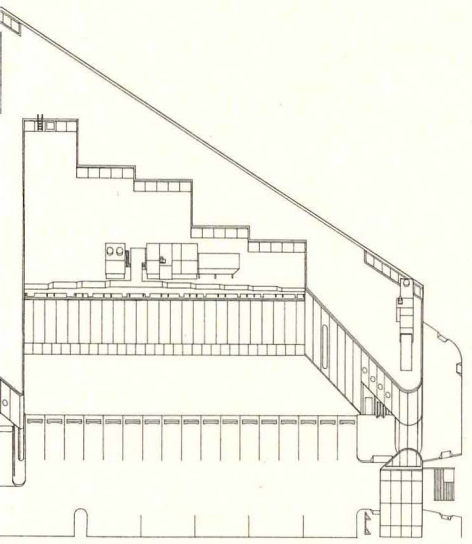




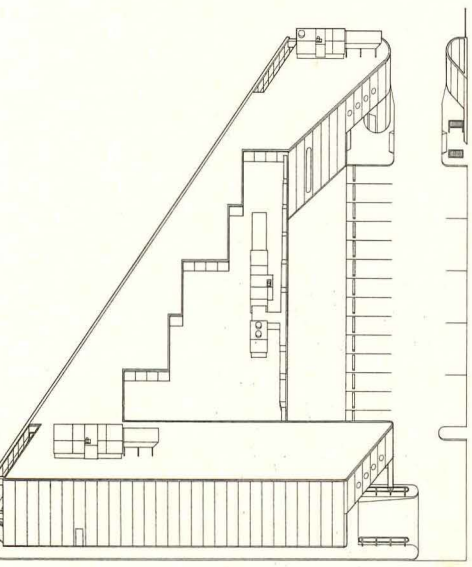
A two-car garage in the shape of an automobile (above, right) will be parked on the lot (below) when completed.







e-dimensional projections indicate several
ent elevations shown within the geometric config-
on the building assumes on this triangular site.



even the rest of the building.

Similarly, the concrete wall leads one down a number of architectural paths only to bail out at the last minute. In the simplest sense, the wall is a response to context, recognition of a major thoroughfare. Yet the building's abstraction, its lack of continuity with the surroundings, however grim, and its disconcerting scalelessness as if one were driving up to a cardboard model, defeat any real melding.

Violating visual preconceptions

One is tempted to read the wall as façade, as the building's face, either in pre-modern terms or as Hejduk or practitioners of the so-called Philadelphia School have revived it. For one thing, Tigerman clearly distinguishes between walls here rather than treating the exterior as skin. He has introduced slots that proclaim the wall as a planar frontispiece, detaching it from the building and giving it a special significance, already implied by the different material, color, and window pattern.

However, this wall is not the frontispiece, not the face, not the entry. The entry is around the corner, contained within the red machine. It has an elaborately symbolic gateway, decked out with flag and signs, leading to an almost Palladian portal, somehow altogether appropriate as a sequential entrance to a linear plan. The concrete wall, screaming to be recognized, has been trumped, and is left a dangling participant, its role contradictory.

Contradictory as well are basic propositions involving material. The juxtaposition of metal and concrete sets up an automatic focus on the contrasting nature of these materials. Yet the minimal fenestration of the quarter-inch metal panels gives them the appearance of extreme weight while the squiggling window denies the real weight of the concrete. Paint is then applied to all surfaces, perceptually reducing them to the uniform thickness of emulsion—yielding yet another reading.

The side of the building that looks taller is two stories, the shorter side is three.

The formality of the freestanding gateway is interrupted by a blue drainpipe whipping through it.

The area of an office increases with the status of the staff member occupying it, but the number of windows decrease. None of them is placed for a view out to the street anyway.

The tyranny of gravity is overthrown by the wavy window but reinstated in bright yellow exposed cross braces.

The building is a series of contradictions, of paths begun but not followed, of assumptions undone but not replaced. Whatever is handy is grist, whether it be the post-war modernism Tigerman was brought up in or the early modern and Beaux-Arts revivals popular now, or work by his contemporaries. Another movement will be explored here too—pop art—when the two-car garage in the shape of an automobile (see model photo) parked on the lot is finished.

Tigerman plays the part of an imp under the influence of dadaists. But he is no dadaist himself. He is too serious about materialist things like finish, about the sleekness of surfaces, the flushness of details, about minimalist colors and shapes. He is serious about hardware and serious when he lines the elevator—floors, walls and ceiling—in Pirelli rubber tile. He is especially serious when he explains how he not only designed the building, not only executed the interiors, but also designed the special calendars and maps, and chose the wastebaskets, dishes, and even pencil cups.

This is Tristan Tzara, coming to you from the Playboy Mansion???

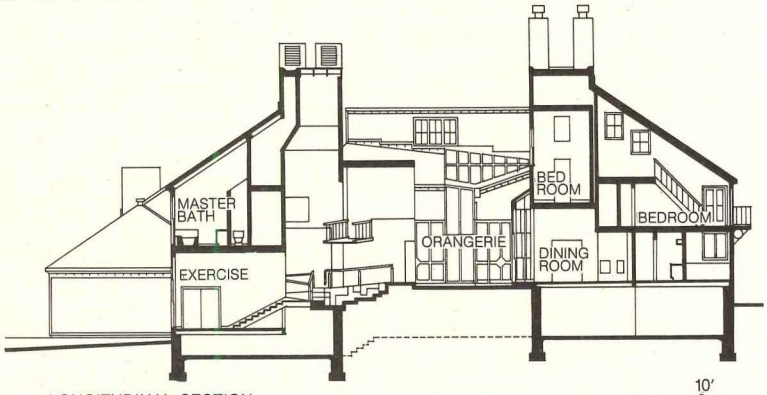
In the end, Tigerman is doing exactly what he says he is doing. He is having fun. While others carry on an architectural revolution/reformation, he is picking up the well and wounded from all sides and playing with them. The formal impertinences of his contemporaries, like canons of dead Masters, are just so much raw material for his conceptual *merzbilds.*

In the end, there is an energetic, sophisticated, formally inventive, and thoroughly responsible building. But there is not really any manifesto. While architecturally aware and attuned, Tigerman is and always has been apolitical.

Data

Project: Illinois Regional Library for the Blind and Physically Handicapped and the Community Library, Chicago, Il.
Architect: Stanley Tigerman & Associates in association with the Bureau of Architecture, City of Chicago. Stanley Tigerman, architect in charge of design; Jerome R. Butler, city architect; Robert E. Fugman, associate in charge; Dan Sutherland, Richard Taransky and Rafique Islam, assistants.
Programs: 32,000-sq-ft public library for 411,000 blind, handicapped and non-handicapped people. Colors are bright for those with weak or failing vision, and to provide pleasant atmosphere for the sighted. Spaces include volunteer reading room, preschool play area, children and young adult section; machine repair area, offices, small branch library on second floor.
Site: app. one acre triangular site on busy intersection southwest of Chicago Circle Campus of University of Illinois. Structural system: Steel frame on 25-ft-square bay; with steel tension cables and turn buckles for lateral bracing. Poured concrete wall facing street acts as a beam to span the 165-ft-long butt-jointed window.
Major materials: steel; baked enamel panels; concrete; gypsum board. (Building materials, p. 134.)
Mechanical system: gas fueled, forced air heating, rooftop units with exposed ducts for heating and a/c.
Consultants: Wallace and Migdal, Inc., mechanical; James L. Mitchell Inc., structural.
General contractor: Walsh Brothers Inc.
Client: Chicago Public Library, City of Chicago.
Cost: $1,950,000, total; $62.51 per sq ft.
Photos: Philip Turner.

Extra sensory perceptions



LONGITUDINAL SECTION

Charles Moore and Richard B. Oliver design a house in the grand manner for a blind man and his sighted family, reminding us that the way a house feels is just as important as the way it looks.

Not far from New York, a large, handsome house sits atop a knoll overlooking some of the most beautiful countryside in the eastern United States. This house is the latest installment in the continuing saga of the Great American Country House, a story that began some 250 years ago in Tidewater Virginia, with ensuing chapters written ever since all across our country. It is a country seat not far removed in spirit from the stately homes of England upon which our earliest grand houses were modeled. But this house is different from all its predecessors in one very important respect: its owner has never seen it. Or has he?

Charles Moore and Kent C. Bloomer, in their recently published book, *Body, Memory, and Architecture* (Yale University Press, 1977), have written, *"The historic overemphasis on seeing as the primary sensual activity in architecture necessarily leads us away from our bodies. This results in an architectural model which is not only experientially imbalanced but in danger of being restrictive and exclusive . . . especially when we consider that all sensory activity is accompanied by a bodily reaction."* Thus they define one of the most salient omissions and most pressing requirements in contemporary architecture: the need to design for all the senses. Perhaps the most glaring fallacy in much of the neo-Platonic architecture of the past half century has been the dangerous belief that a humanly satisfying building need not take more into consideration than proportional perfection or compositional purity. Many such buildings have attained their diagrammatic climax much more effectively in two dimensions than they ever have in three; but a house for real people with real bodies must account for much more.

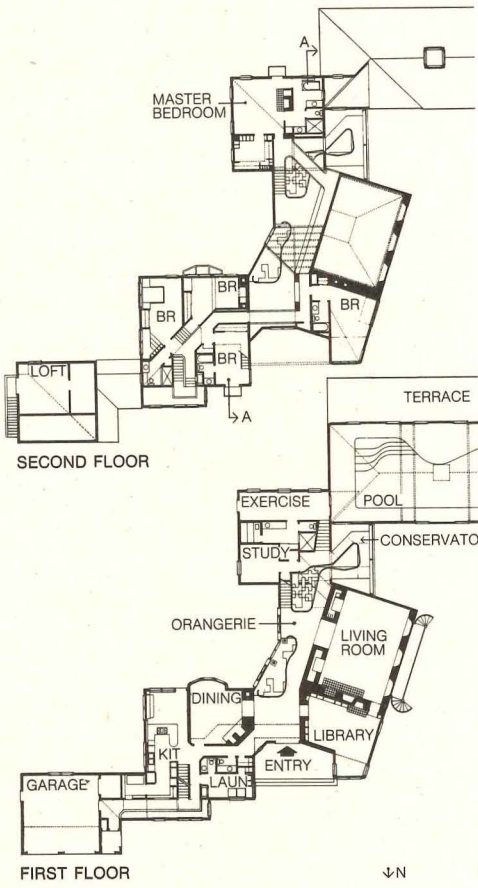
When Charles Moore and Richard B. Oliver were commissioned to design a house for a man who had lost his sight three years earlier, they found a unique opportunity to implement solutions to those neglected aspects of architectural design, and, in Moore's words, "to make something that could be felt as well as be seen." The architects did not approach the program with the genteel reticence, the euphemistic circumlocution, that turned the client and his wife away from several previously considered architects who could not even mention the inescapable fact of the client's blindness. But Moore and Oliver were not afraid to speak the unspeakable, mainly because the exigencies of the situation dovetailed quite neatly with concerns these architects have dealt with elsewhere. And so began one of the most inspiring architect-client relationships in recent history.

On his blindness

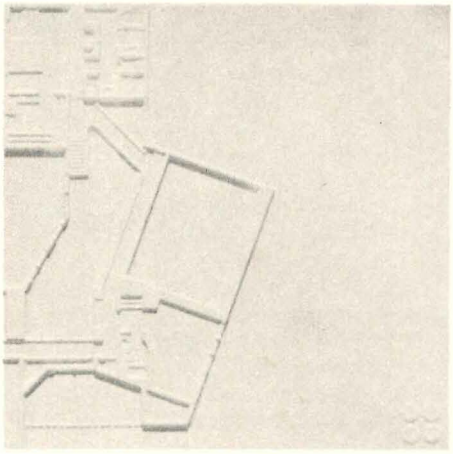
The first and most pressing problem the architects faced was how to make their plans "visible" to a man who cannot see. A partner in Charles Moore's Connecticut office had recently built a vacuum press, and it was immediately put to use in making three-dimensional plans, raised in those areas usually drawn in *poché* on a traditional plan. Thereby the client literally was able to let his fingers do the walking, and from the very beginning could participate in the design process with an involvement unusual even in a sighted person. The client's main requirements were quite simple: he did not want his house to look like a home for a blind man, and he wanted its design to enhance the independence that he correctly understands to be a handicapped person's strongest desire, and, more often than not, his most humiliating deprivation. This is especially true in the case of this man, who remains active, agile, and athletic.

The client is a victim of a disease called *retinitis pigmentosa,* a rare congenital condition that causes irreversible degeneration of the retina, and which is therefore unsusceptible to eye transplants. Once thought to afflict only the old (and therefore often misdiagnosed as an extreme result of the aging process), *retinitis pigmentosa* has just recently been recognized as an inherited condition. Though usually appearing only in middle age, the symptoms in this man's case began in his early 30s, and advanced with uncommon speed: within nine months of the onset of the disease, his sight was gone. But if you have tears to shed, forget it. Since he went blind this remarkable man has gone on to ski every slope at Aspen (though naturally he favors the runs with the fewest trees), and has been seen to wander off of an afternoon to pick fruit on his property, unaided, returning with arms full of peaches.

In their construction of an environment that would enhance and exploit their client's unimpaired sense of his body, the



House evokes numerous images, from 18th-Century manor houses to 1920s "Wall Street Pastoral."



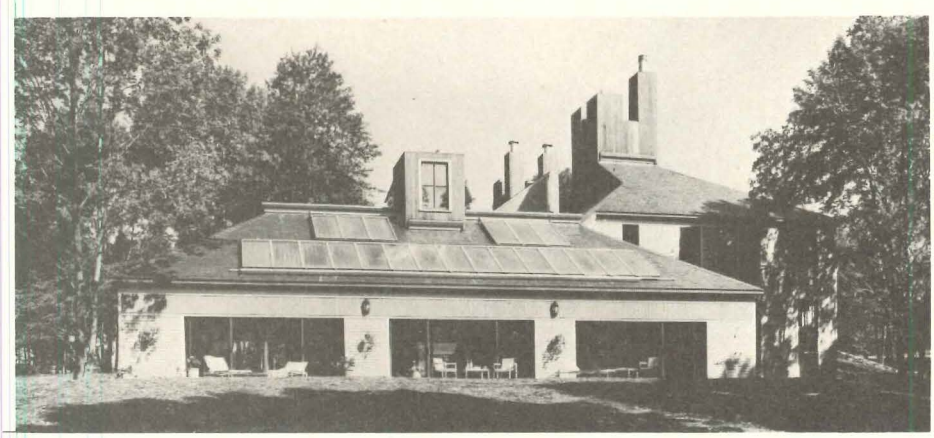
Vacuum-form plan of segment of first floor.

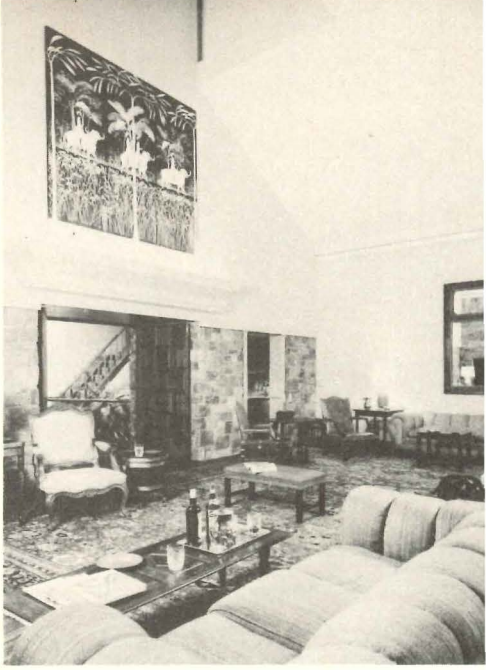
architects first considered his circulation and movement through the house. Blind people have well-known difficulty negotiating corners (or at least while preserving their dignity, since they often bump into them), so one of this house's major design themes came from the chamfering or rounding of most corners. That gentle modification eases him along the way inside the house, as does the other major circulation aid: the varying textures used underfoot to indicate one's position in the house.

See me, hear me, touch me

On the first floor, large, earth-colored Mexican quarry tiles are used in hallways and the kitchen, and the bumpy, handmade texture of the tiles gives the house's owner the feeling of unexpected adventure beneath his feet that he enjoys. Upstairs, wall-to-wall carpeting is used in the circulation areas, providing the sound reduction that the client demanded, his hearing having become, typically, more acute since the loss of his sight. In the rooms of both floors, the owner's wife vetoed the use of wall-to-wall carpet on aesthetic grounds, and accordingly the oak plank floors are covered with room-size oriental rugs. Thus, just by the feel of the floor underfoot, the client can determine where in the

South side of house (above and below) has triple-hung window leading from dining room to terrace, based on a similar design by Jefferson. Belvedere windows atop pavilions cool house naturally.





Pool pavilion (above) has solar collectors for heating and belvedere window for cooling. Living room (right) has indirect lighting, belvedere windows.

house he is. His increased dependence on his sense of hearing made the client especially eager to have discrete, aurally intelligible spaces in which to live, making it possible not only for him to gauge his own whereabouts, but also to be aware of the approaching presence of others. For instance, the sound of footsteps in a small, uncarpeted entry niche between tiled hallway and carpeted living room announces an arrival.

Not all the compensatory considerations were quite so protective as all this sounds. Many others were conceived for sheer sensory delight, and would be welcomed by any sensually aware person, even if he could see—as indeed three-quarters of the inhabitants of this house can. Not one of the senses is forgotten. Since the blind live in a world of surfaces, great care was taken in the tactile qualities of the materials used here. Most visible—and possibly the only giveaway that a blind person lives here—is the gorgeously crafted mahogany railing that winds its way through the central orangerie. It was on a stop at a small airport in western Pennsylvania that the owner and his wife simultaneously grasped a handrail and at once remarked on its singular pleasantness to the touch. Richard Oliver, who was responsible for most of the house's thoughtfully conceived and exquisitely executed detailing, sent for copies of the working drawings of the airport prototype, and produced a close, albeit considerably more elegant, facsimile.

Though blind, the client's eyes are nonetheless peripherally light-sensitive, making the question of illumination an important one. Direct artificial light is painful to him, so as a result there is not a single exposed light bulb in this house (especially unusual in a work by Charles Moore, whose familiar rows of exposed light bulbs have become one of his most widely copied trademarks). Indirect lighting was used wherever possible, but the numerous inventive solutions never seem institutional nor are they even particularly noticeable. For those who can see, the house has a particularly restful visual aura, and though prompted here by dire necessity, the lighting emphasizes yet another area wherein design for the handicapped has much to instruct in design for everyone else.

Music to his ears

A dazzling array of ceramic tile was used throughout (see P/A, March 1978, p. 96), not least of all because the client likes its cool, smooth surfaces, and its rich visual range (like so much else here) makes one realize that you don't have to be blind to enjoy it. The most vivid tiles of all,in a loud Art Deco pattern called Ritz Bar (which, *naturellement,* also can be found in the bar of the Ritz Hotel in Paris) line a craggy fountain sunk into a fissure in the floor of the orangerie. The fountain is the image of a geode—that recurrent Moore motif—with the rich purples and greens of the tile bursting forth amidst the terra cotta paving. But the fountain delights another sense, too: metal tuning forks are embedded in the fountain and produce a pleasant tinkling sound as water splashes over them.

The free-form planting areas in the orangerie (and in the conservatory, not far behind it) contain several varieties of fragrant plants such as lemon trees, providing an olfactory experience for what is undoubtedly the most neglected of all the senses in our deodorant-obsessed society. The house also has a brilliantly worked out natural ventilation system that obviates the use of the air conditioning system on all but the most oppressively hot summer days and also eliminates the annoying background noise and stale odors that conventional mechanical systems habitually produce. As a result, the owner, seated in his living room cooled by a ventilation window high above his head, actually can smell which way the wind is blowing by the fragrance it carries: from the pine forest on one side of the property, or from the peach orchard on the other.

With a slight stretch of the imagination, then, it can be said that the architects have provided for all five senses: for if the fruit grown in the orangerie can be eaten, then the sense of taste can be added to the senses of sight, touch, sound, and smell which are not only enhanced, but also imaginatively intermingled here. The staggering breadth of detail to which the architects addressed themselves makes this job a triumph of logistics as well. A set of "red books" documenting every single specification and every last design decision were compiled and referred to at the design conferences (well over a hundred in all) between the architects and their clients. In that way, the potentially daunting range of issues in designing a house for a blind man could be approached methodically and thoroughly, the only rational answer to dealing with the number of things to be considered in this 12,000-sq-ft house. One such unforeseen case in point was the installation of an electric eye in the house's indoor swimming pool, activating small jets of hot water as the swimmer approaches the end of the pool, warning of an impending collision.

Vision for the future

Architecturally, this house is a superb achievement. This cluster of five slate roofed pavilions has the unmistakable blend of ease and land-derived grandeur that makes it an inescapably American house. It marks the beginning, perhaps, of a new phase in Charles Moore's career: this house has a greater sense of repose than any of his other houses since his own Orinda house of 1961, which in its general massing seems a more direct source than Stratford Hall, the Colonial plantation house often invoked by Moore and others. Sensitively sited (with the advice of Moore's sometime partner, William Turnbull, who grew up on similar terrain), this house is as in touch with its surroundings as its master is with his.

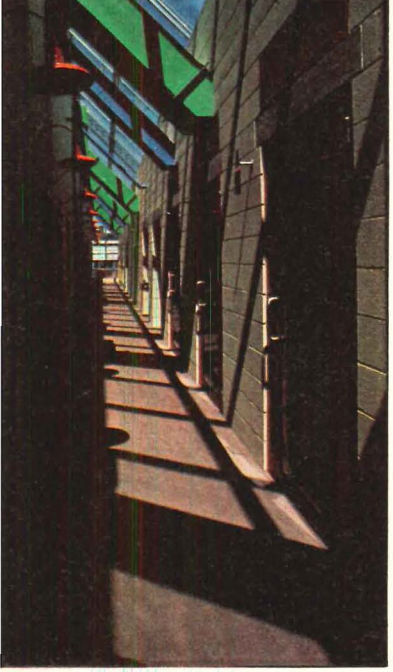
Not for a moment did Moore and Oliver see this commission as anything less than (as the former has put it) "a chance to do something not in the narrow visual mold of the Modern Movement." They and their patron took the harsh realities of his blindness and seized the opportunity with the same sense of daring with which the client approaches every step in his life. As a result, this man can see his house far more

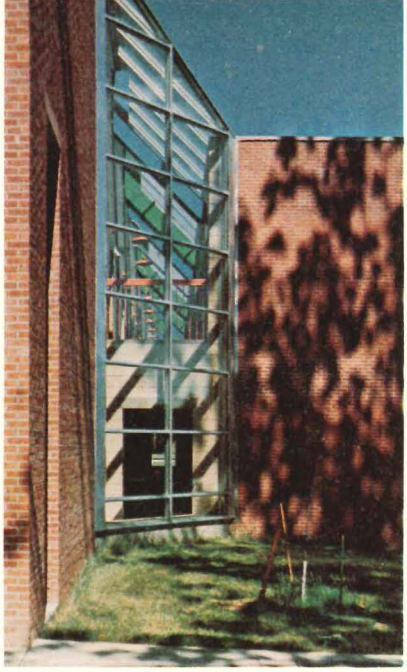
completely than many of the rest of us can see our own. This house could well be an historic turning point in the way architectural design is perceived: not as a function of any one sense, but of all of them. Here two talented architects and their equally talented clients show us the way. Will we follow? [Martin Filler]

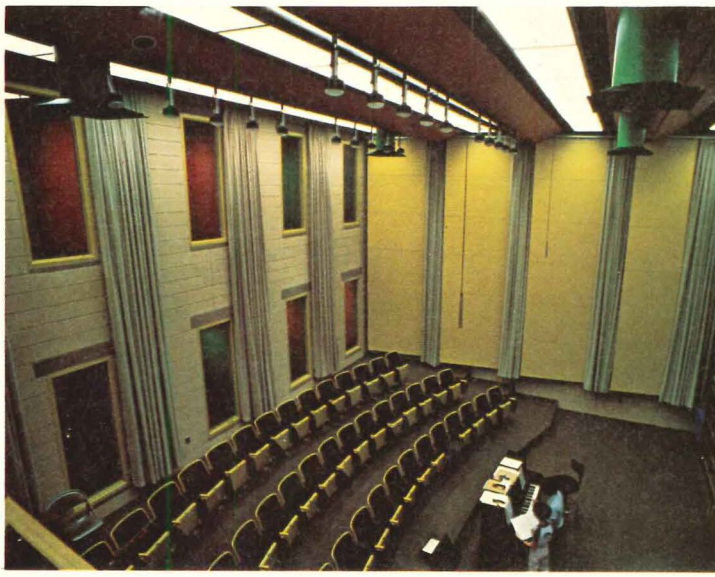
Data

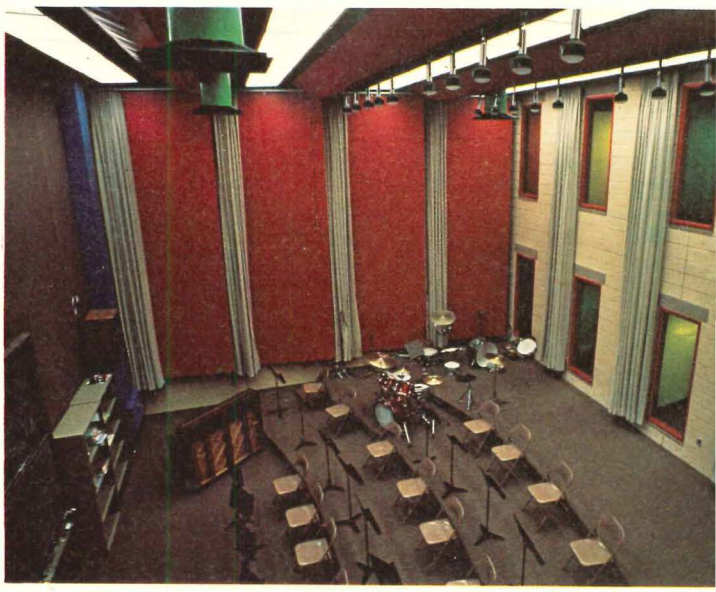
Project: house near New York
Architects: Charles Moore and Richard B. Oliver.
Program: a residence for a family of four, designed to accommodate the blindness of the owner, appealing to his remaining senses, while also appealing visually to his sighted wife and children and to visitors.
Site: 200-acre rural farm, close to a large urban area.
Structural system: wood-frame construction, box beams and trusses.
Mechanical system: natural ventilation system, optional air conditioning, solar-heated hot water and solar-heated swimming pool.
Major materials: cedar clapboards, redwood boards, gypsum board, fieldstone, and slate. (See Building materials, p. 134.)
Consultants: Everett Barber, mechanical; Spiegel & Zamecnik, structural; Milholland & Olsen, interiors; Tina Beebe, color; Richard C. Peters, lighting.
Contractor: withheld at request of client.
Client: withheld at request of client.
Cost: withheld at request of client.
Photography: Norman McGrath.

Orangerie (above left, above right, and right) is central circulation link in house. Mahogany railing winds through first floor paved with Mexican quarry tiles (above left), and leads to carpeted second floor (above right); flooring shift signals location in house. Indirect lighting in second-floor hallway (above right) illuminates corridor, but is protective of owner, who, though blind, remains light-sensitive.







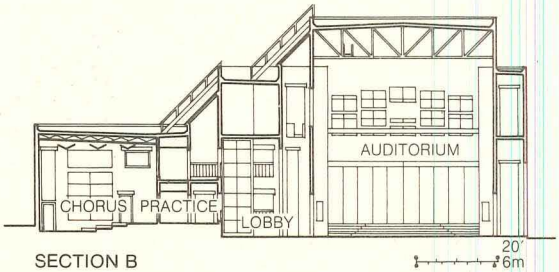


In both the chorus room (above, top and middle) and band room (directly above) vivid and contrasting colors are used to help the blind students, many of whom have some sight, move about the building more easily. The completely glass-enclosed corridor (top, left) acoustically separates the band/chorus wing from the auditorium (shown on following pages). The catwalk (left) running between the auditorium and its lobby leads to the third floor mechanical penthouse and to ceiling apparatus of auditorium.

Auditorium and Music Building, Kentucky School for the Blind, Louisville

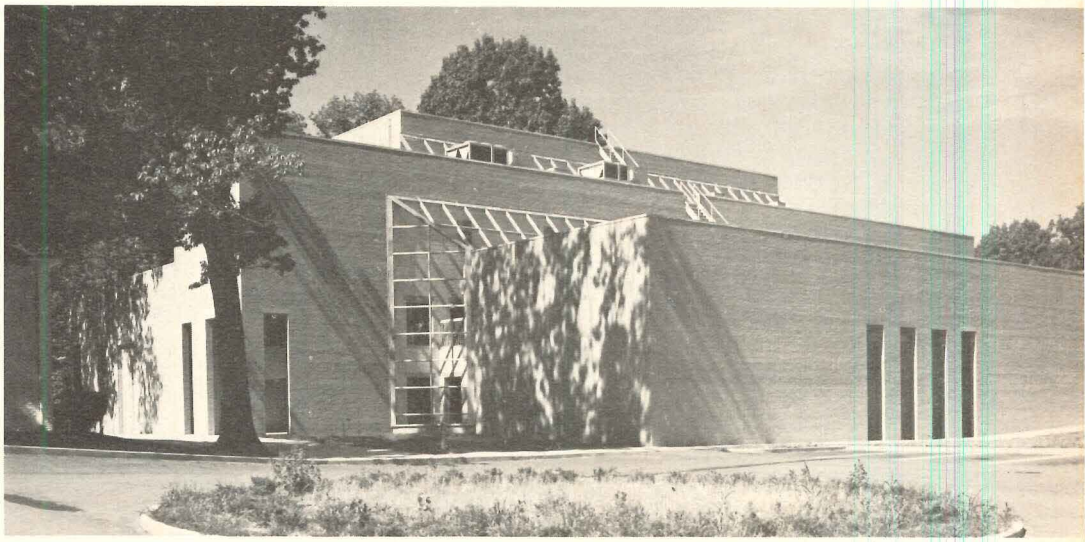
Hearing is believing

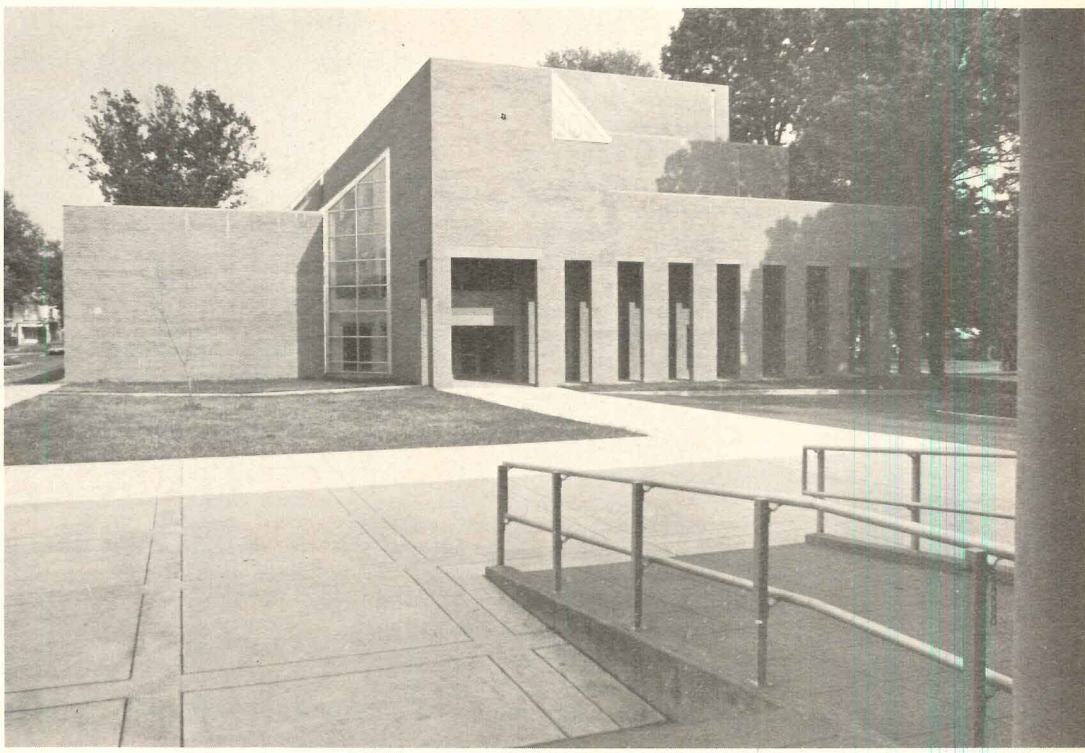
William Morgan



SECTION B

In Jasper Ward's music school for the blind, physical and visual properties of space are exploited and emphasized to heighten the building's legibility.


The music building at Kentucky School for the Blind is clearly articulated in a massing of bold, hard-edge forms, with entrances cleanly cut from the brick walls. Such devices, and the use of vivid colors inside, help partially-sighted students "read" the building's physical cues.



The new Auditorium and Music Building of the century-old Kentucky School for the Blind in Louisville demonstrates that it is possible to produce exciting design for the handicapped, even with limitations of budget and governmental regulations. Dedicated last October and already professionally recognized by a 1977 Kentucky Society of Architects Honor Award, the new music school is also the most notable example of contemporary architecture erected in Louisville in recent years.

Louisville has a rich and generally appreciated 19-Century architectural heritage, but new construction in Kentucky's largest city is characterized by conservatism, timidity, and a sort of *déjà vu* aspect, as the current styles of the East and West Coasts seem to appear here about a decade late. This all-too-common provincial myopia has caused the city to overlook the considerable talents of Jasper Ward and the young designers that he attracts to his office—easily the most avant-garde architectural firm in the region.

The unassuming exterior of the music building perhaps explains why Ward has been a prophet without honor in his own city. His existing buildings, and even his schemes for converting local grain elevators and a railroad bridge over the Ohio River into apartment blocks, tend to stress a combination of imagination and function at the expense of the sort of monumentality and egotism that capture the public's eye. Avoiding the temptation to upstage the all-too-boring institutional structures that dot the Kentucky School for the Blind campus, the terra cotta-colored brick of the new building blends sensitively with its neighbors.

The building's main façade is a flat brick

Author: William Morgan is an associate professor of fine arts at the University of Louisville.

wall interrupted only by a colonnade. The simple, boxlike masses of the building are consciously plain, but the sharp edges created by the unarticulated corners give the feeling that the brick is not solid or weighty, but rather a thin skin stretched tautly across the building's surface.

The simple device of the full-length colonnade—an ideogrammatic classical stoa—makes a respectful reference to the original School for the Blind, a monumental Greek Revival building erected in 1855 and, sadly, demolished a few years ago. The deep recesses of the colonnade, piercing the wall instead of projecting from it, give a sense of mystery. As one walks in front of it, the openings change in relationship to one another, resulting in a dynamism and a rhythm not unlike a musical scale. Because the students are trained to "feel" space and obstructions, the rhythmic and sound characteristics of this and other spaces have been consciously exploited. In some spaces carpet is used on walls, and acoustic drapery, acoustic glass, or metal reflecting panels are also used to achieve special acoustic individuality.

The factorylike—even severe—exterior is in direct contrast to, and serves as an appropriate functional container for the bright, multicolored interior. The use of color here, on elements such as exposed ductwork, is more than just another example of the "exposed pipe school" that has become such a design cliché, for all of the colors are basic to the architectural program of the building.

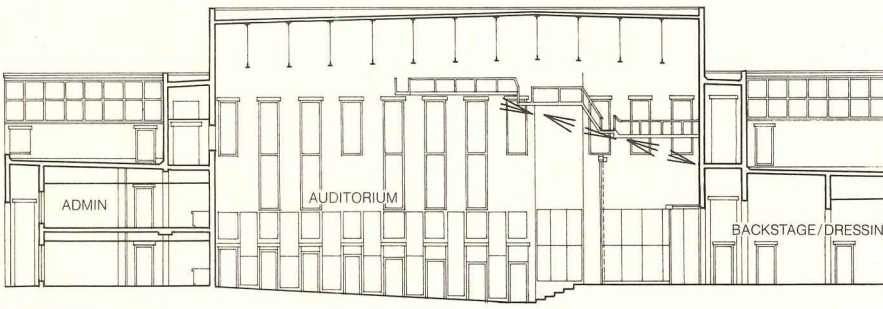
Color codes

Most of the kindergarten-through-12th-grade students are legally blind, but have some degree of vision. They not only respond to bright colors, but the colors also act as a guide to the building's different functions.

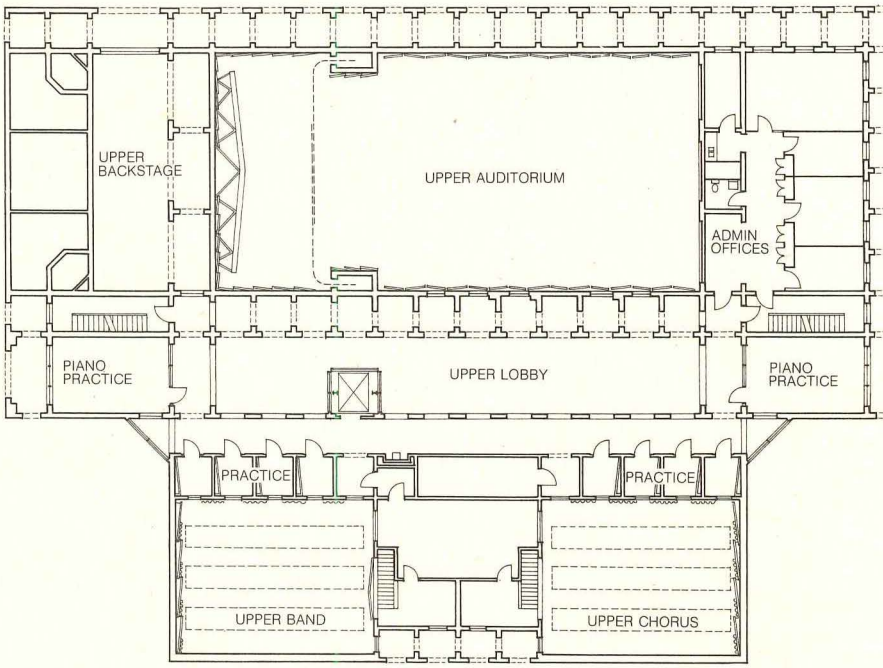
Yellow identifies choral areas (including a 42-seat hall-classroom), while bright red is for exits, a lighter red is for the band room and instrument storage areas, and orange is for public spaces. A mixture of primary colors is employed for 16 practice cubicles and two piano practice rooms. Blue and green are reserved for heating and cooling pipes and ducts.

But the colors serve a far more important psychological role in establishing an air of brightness and exuberance. Orange, for example, is used in the main 300-seat recital hall where painted truss-work offsets the neutral-tone cinder-block walls. The intensity of the orange acoustical panels on the walls and ceiling subtly changes in relation to their distance from the stage.

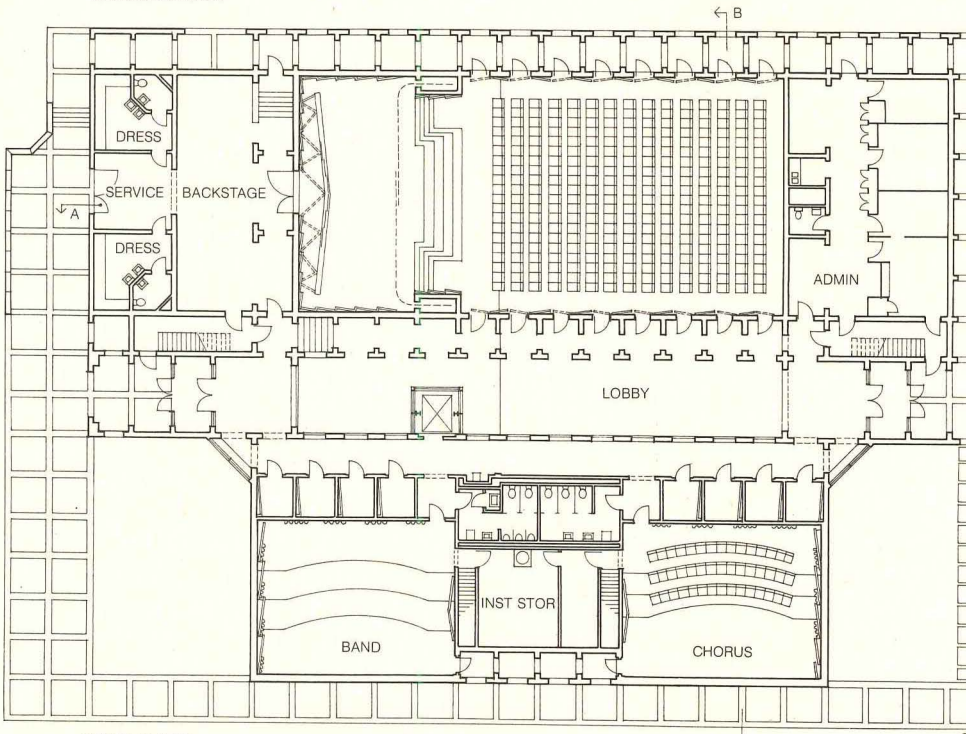
The auditorium, which is used for theater and movie showings, as well as for recitals, is built in traditional concert-hall "double cube" configuration of 40′ x 40′ x 80′. Despite its size, the hall achieves an intimacy and respects the building's scale by being set below the main floor level. Its excellent acoustics are assisted by floor



SECTION A



SECOND FLOOR



FIRST FLOOR

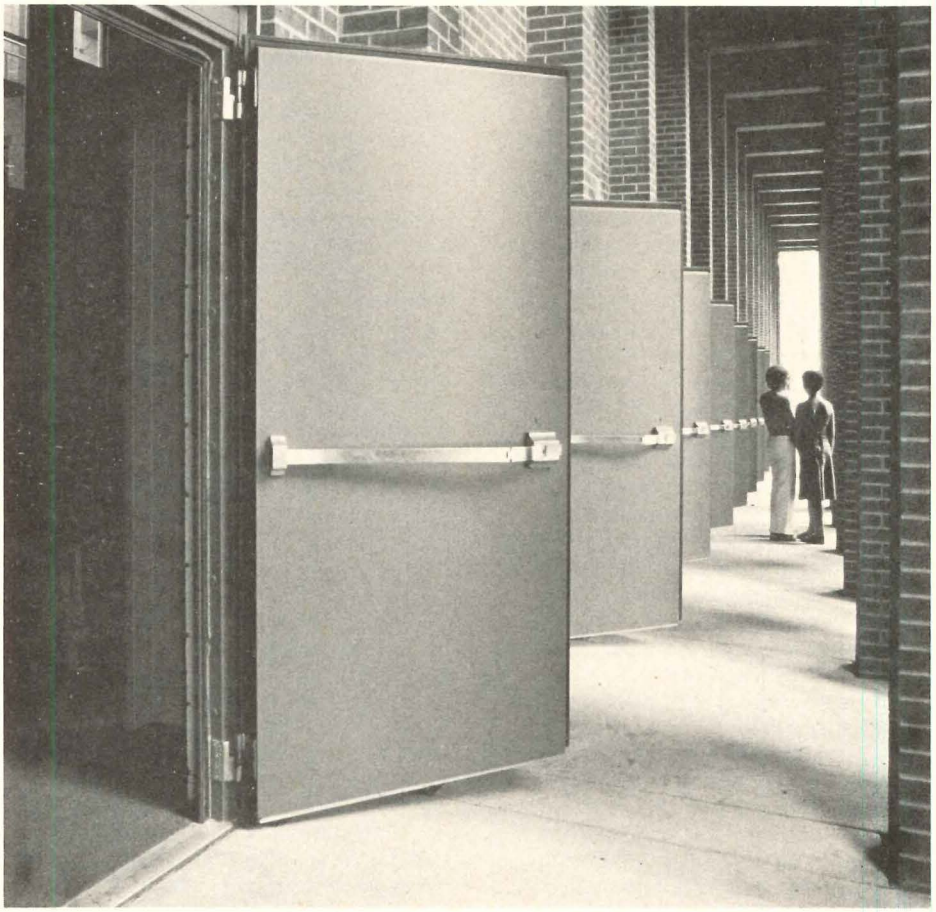
and wall carpeting, acoustical glass, and metal reflecting panels.

Whimsical gooseneck lamps, also painted orange and looking as though they were borrowed from a railway station, line the vestibule outside the auditorium. This two-story main entrance and lobby space also separates the building's community and teaching functions. It is flanked by brick arcades that echo those of the exterior, and whose 7′-4″ interstices also act as acoustical guides for the students. In the center of this atrium is a red elevator in a yellow shaft.

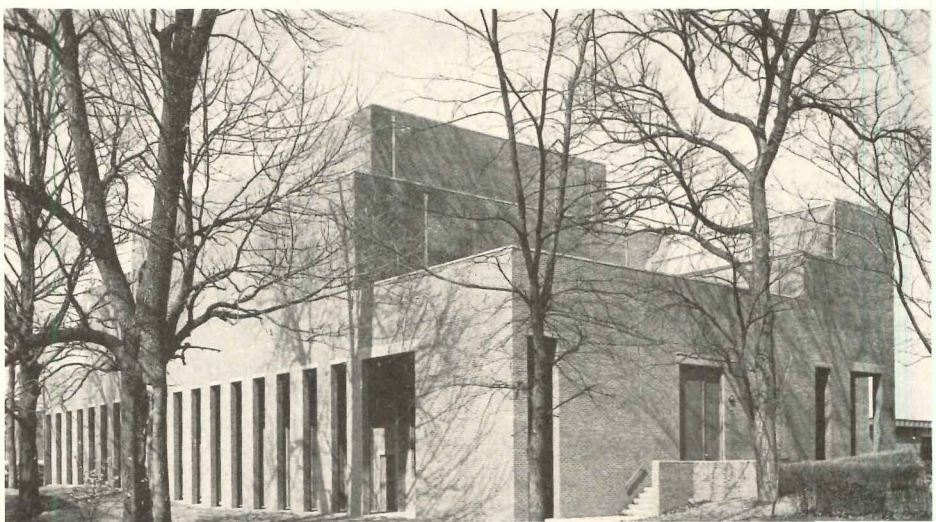
Through the arcade opposite the auditorium entrance one can glimpse the multicolored practice rooms, as well as the yellow choral and red band rooms. The two-story hallway running between the practice cubicles and the atrium is covered by a north-facing skylight roof that further illuminates the interior. The offices of the administration section are set off to one end of the building, on the same side as the recital hall and facing the rest of the campus.

Some observers may find echoes in the music school of work by other architectural firms, such as Mitchell/Giurgola or Venturi & Rauch in its exterior plainness, or Hardy Holzman Pfeiffer in its use of color and exposed ducts. Louisvillians may miss the proportional subtleties of exterior massing, but there is no doubt that as a facility for the visually handicapped the building works well. In providing a pleasant environment for those with impaired vision, the new music school also enriches the visual environment of the sighted.

In auditorium, bright orange wall and ceiling acoustical panels contrast with buff-colored brick.



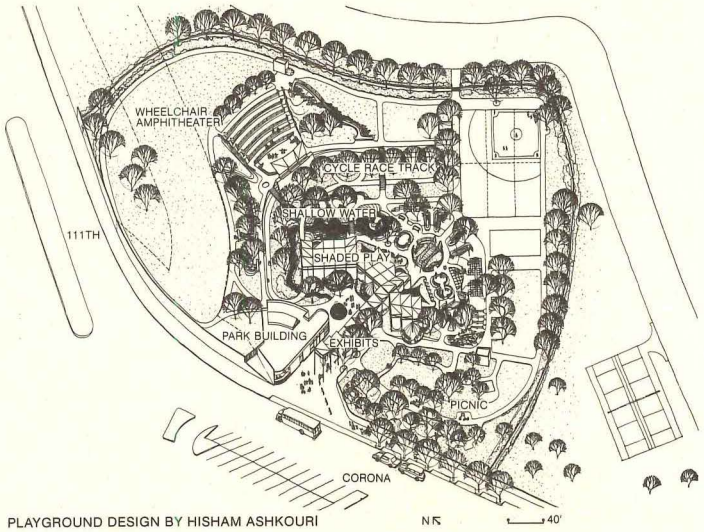
Auditorium entry colonnade (above, below) creates visual/audio rhythm that helps guide students.



Data

Project: Auditorium and Music Building, Kentucky School for the Blind, Louisville, Ky.
Architect: Jasper D. Ward; Robert K. Kingsley, project architect.
Program: a music education and performance facility, with administrative offices, for kindergarten-through-12th-grade students, 90 percent of whom are legally blind.
Site: a school campus, enclosed by existing buildings on three sides but facing a pedestrian plaza on fourth side.
Structural system: reinforced fully insulated concrete masonry supports concrete slabs and concrete fill on acoustical metal deck supported by bar joists and fabricated steel trusses.
Mechanical system: roof mounted HVAC units provide zone control; heating is electric.
Major materials: reinforced concrete, concrete masonry, metal deck, steel trusses, extensive carpeting on floors and walls, acoustic drapery, acoustic glass, metal reflecting panels. (See Building materials, p. 134.)
Consultants: R.B. Whitney & Associates, mechanical; Hummel Engineering Associates, structural; Coffeen, Anderson & Associates, Inc., acoustical.
General contractor: Wehr Constructors.
Client: Commonwealth of Kentucky.
Cost: $1,589,287.30; $60 per sq ft.
Photography: Jasper D. Ward.

A playground for all children



PLAYGROUND DESIGN BY HISHAM ASHKOURI

Competition elicits imaginative designs for a park usable by all children. No drab handrails here!

An approach to designing a playground for disabled children as well as for the able-bodied is to recognize what the child can do, not what he can't do. Children confined to wheelchairs, for example, can use their highly developed chest and arm muscles with dexterity. Many of the schemes submitted in the Playground competition of the New York departments of City Planning and Parks and Recreation (P/A, May 1977, p. 24) include games and equipment with emphasis on strengthening these upper torso abilities.

The winning design, by Hisham Ashkouri of Cambridge, Ma, is noted especially for its integration of wheels and rolling equipment into a concentric plan designed for supervision with minimal staffing. "There's almost an advantage to being in a wheelchair," remarked the man responsible for the competition, Saul Nimowitz, special projects director of the planning department.

After entering through a pavilion-shaded court, the child visiting Ashkouri's park travels along a path past a chimes near the entrance (to help orient blind children) and around such activities as a water wheel activated by hand pumping and a traffic game that uses standard highway signage and signals. The entrance canopy is a modified space frame of modular laminated vinyl panels, each of which could easily be replaced if damaged. Unlike some of the competition entries which had steeply inclined ramps or remote lookout spots that deliberately challenged the young visitors, Ashkouri's park is gentle and promotes discovery rather than conquest. Construction of the park is to begin in July and the facility should be ready by the summer of 1979.

As with most parks, adult supervision is provided, and here Ashkouri has shown a hightened awareness of the user's needs—both the adult's and the child's. For the activity areas there are benches nearby, within a few paces, but they nevertheless are tucked out of the way so adults do not intrude on the young people's play, but are not so far removed as to be ineffective.

One of the approaches Ashkouri took, which intrigued the jurors and the city planning staff, is the way he adapted traditional playground equipment, such as slides or monkey bars, for use by the handicapped. They feel the possibilities for this application throughout the country are tremendous, since the transformed equipment poses no radical design changes and easily and economically could be incorporated into most public park operations.

Ashkouri also won commendation for his idea of using the 1880s hand-operated railroad car as a ride for the park. The flatbed car—to be made of bicycle components—would be large enough to hold a wheelchair and a standing individual.

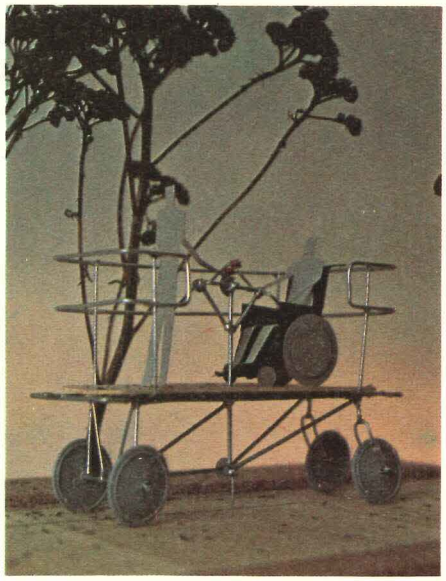
Part of the competition program was that any individual playground concept could be purchased outright from its originators (for $375) and offered to the finalists for inclusion in their second stage design; the prototypical components also would be available for use in other neighborhood playgrounds. This aspect of the competition, which Nimowitz believes is a first, resulted in the purchase of 70 ideas ranging from a giant marionette manipulated by pulleys (the design team, Paul Marchand, Robert Sweet, Donald Koblintz, and Stephen Jones of Round Lake, NY, thinks the toy should be an effigy of the New York mayor) to a seesaw with arched bars so kids can move themselves up and down by hand.

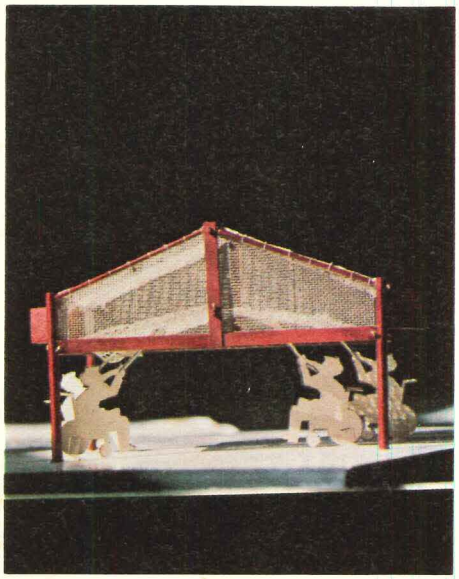
Of the four finalists, Robert Toole of Saratoga Springs, NY, was the freest in implementing other people's ideas in his final scheme. Toole suspended the games from a 30-ft-high space frame so that the equipment could be retracted into the frame at night, to prevent vandalism, or at times when too many games in use would be undesirable. His plan called for vertical as well as horizontal organization, with play sections (according to ages) linked by concrete ramps. The park was surrounded by a wall of galvanized crushed automobile bodies. The cost of the ramps and the crushed car wall, as well as safety concerns, ultimately ruled out Toole's proposal.

The design of finalist Richard Dattner & Associates—Thomas Bittner and Joseph Smith—of New York was cited for its imaginative handling of a water course, which starts at a high level with a windmill and flows through a series of troughs elevated so that children can play comfortably. Dattner's particular approach was to create a typical playground and then eliminate the physical barriers and dangerous conditions that would prevent handicapped young people from using the grounds. His experience in designing barrier-free parks dates from 1970 when he created the playground for the Rusk Institute for Rehabilitative Medicine, New York.

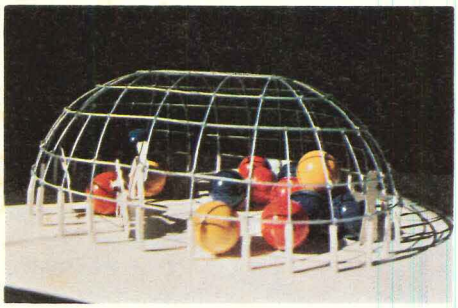
The fourth proposal in the finalist group, by Paul Benowitz and Secundino Fernandez of Rye, NY, contained several delightful games which undoubtedly will be included in the built park: the giant beach ball game, a fenced area crammed with beach balls; and the broom ball game, a volley ball "court" contained in an overhead net where players on foot or in wheelchairs hit the ball back and forth with brooms. This park was to be screened with a large tent suspended on cables, a feature which subsequently was considered too costly and physically vulnerable.

Funding for the competition came from a Community Development Block Grant and from a group which has been active in forwarding the needs of the handicapped, the Eastern Paralyzed Veterans Association. Terence Moakley, the veterans' barrier-free design director, who uses a wheelchair himself, could offer no negative criticism of the finalists' park designs other than to question the durability of some of the software games. He was enthusiastic about Ashkouri's 1880s hand-pumped car since it would encourage able-bodied and disabled children to play together.
[Ann Carter]

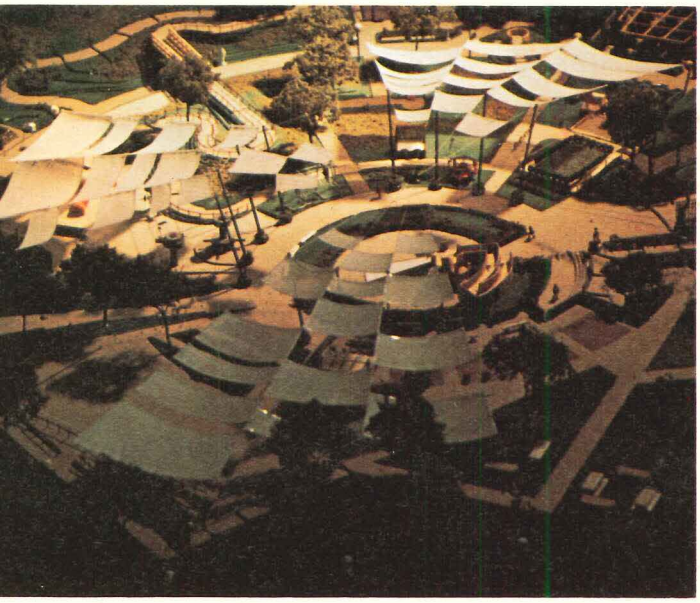




Hisham Ashkouri

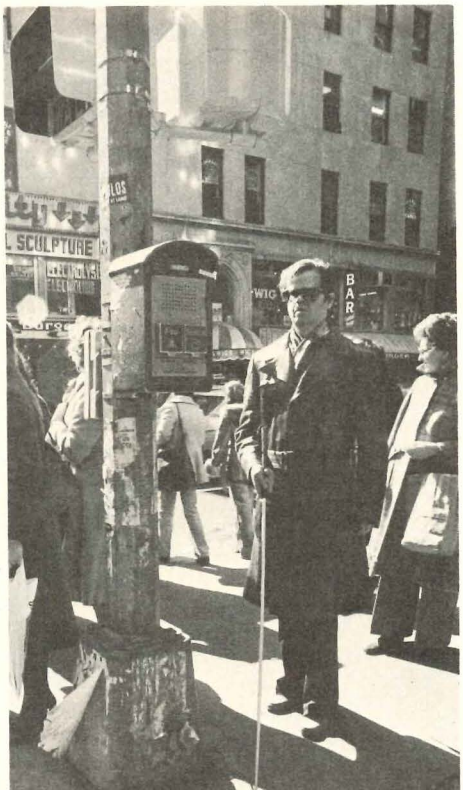


Park components (top, clockwise): 1880s type railroad car and a slide by Hisham Ashkouri; broom ball and giant beach ball games by Paul Benowitz and Secundino Fernandez. Model of Ashkouri's winning scheme (left); models of schemes by finalists Benowitz and Fernandez (below, left) and Robert Toole (below, right). Playground site is Flushing Meadow, Queens, where the 1964 New York World's Fair was held. Photos: George deVincent except as noted.



De-institutionalizing for the blind

A projected learning center in an urban area offers some interesting solutions for a specialized program and clientele.



Photos: Dorothy Alexander

In the center blind will learn how to move freely on their own in the outside world.

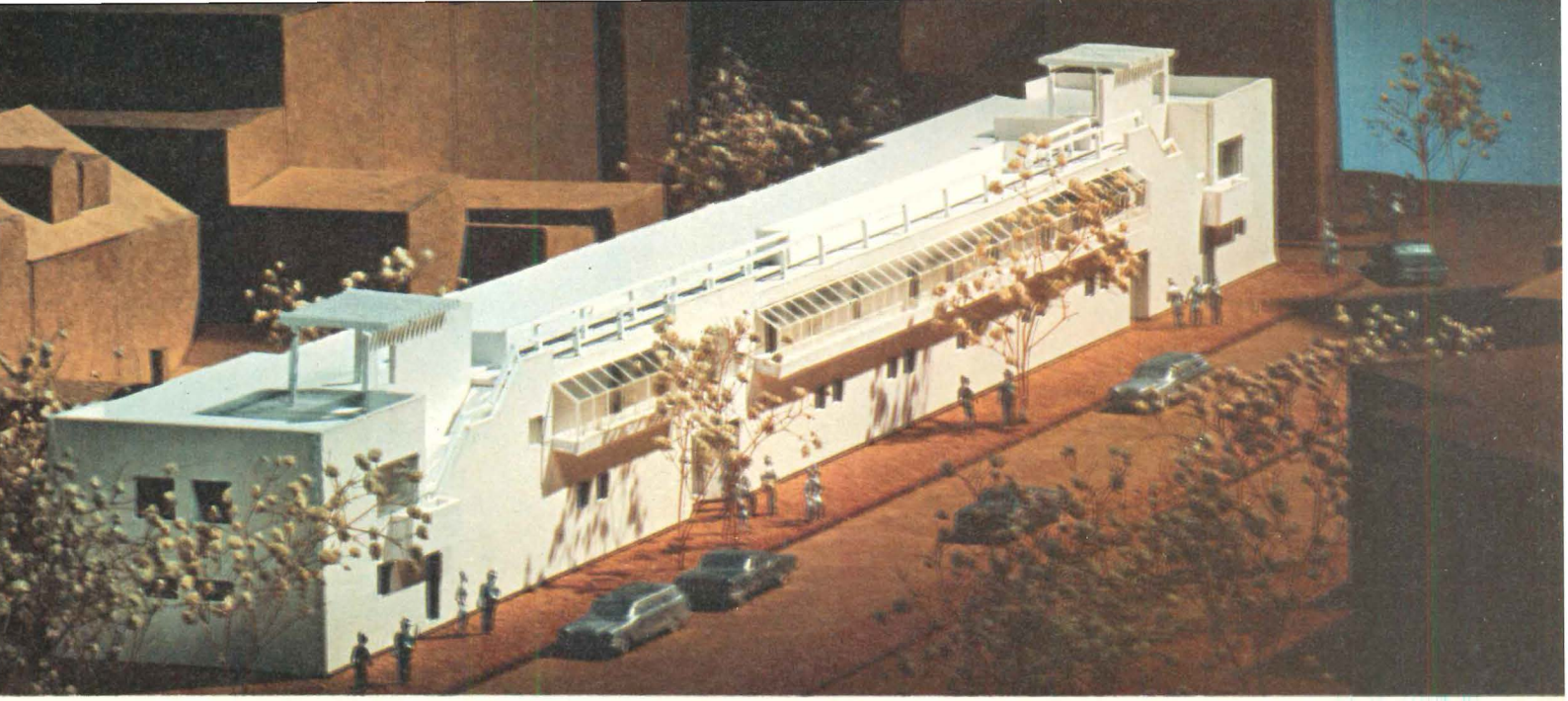
A building that is both contextual in terms of its adjustment to the configuration of the surrounding urban landscape and progressive in terms of its response to design guidelines for the blind is planned for a busy section of Boston. The approximately 13,500-sq-ft facility, in the Bay Village section of Boston, is a linear block that forms a strong wall on the narrow site (35′ x 270′) on Tremont St. Confronted with the difficulties of this site, cleared for a since-abandoned urban renewal project, architect Graham Gund organized the functions of the facility in a linear block. Thus he was able to keep the street line while permitting the building to remain low in scale to fit in with the surrounding neighborhood of early 19th-Century townhouses. For this reason, too, the building's entry façade is faced in brick, although the rear elevation, overlooking a garden, is faced in stucco. (The structure is simple and conventional: open web steel joists span the 27-ft width on a 9′-10″ system of structural bays; floors are concrete.)

The facility, a transitional home, is part of an evolving effort to "de-institutionalize" the living environment of the blind and train them to become self-sufficient enough to lead normal lives. Thus, for example, residential units are clustered with cooking and dining facilities to allow residents to accustom themselves to apartment-style living.

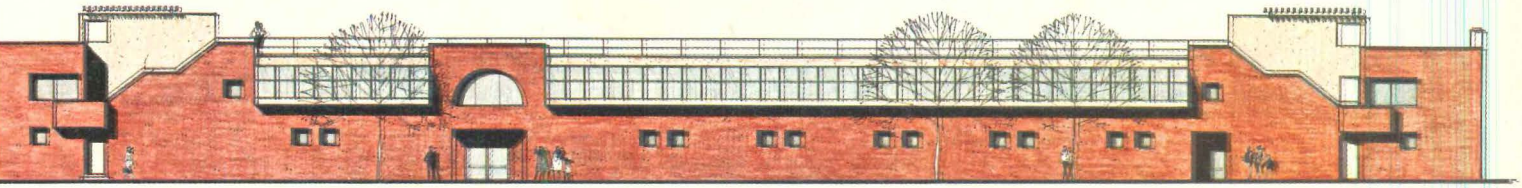
The living units, located on the second floor, are subdivided into private rooms that open onto semi-public living areas to encourage socializing while still permitting privacy. A linear corridor connects all these spaces, and forms the primary organizing element for the blind. A "greenhouse" bounding one side, plus colored glass panels in this south-facing wall (for those who can dimly perceive colors), and tracking strips along a wall will permit those using the hall to differentiate the groupings of spaces while maintaining a basic point of reference. Openings and sitting areas in the hallway orient blind residents, and provide the possibility for different types of social interaction.

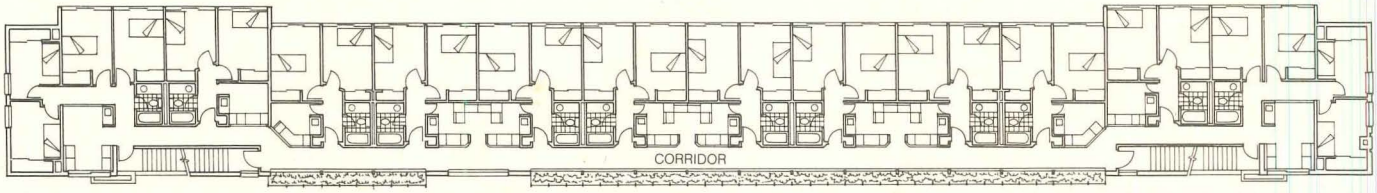
Communal rooms will have a change in ceiling heights so that the acoustics will change, further distinguishing different functions. Furniture, however, is designed to be stationary to reduce possibilities of accidents. At the same time these considerations predominated in the design conceptualization, Gund had to be careful not to *overdesign* safety features since the program places high value on self-sufficiency for the residents.

The publicly oriented areas such as out-patient services, teaching and recreation rooms, plus administrative offices for the client, the Massachusetts Associations for the Blind, are placed downstairs on the street level. A well-defined public entrance, however, is kept separate from the residents' entrance. All in all, the scheme seems as if it should succeed in its intention—creating a noninstitutional setting that responds empathetically to the goals of the program and sympathetically to the urban context. [Suzanne Stephens]



Front elevation is planned to be faced in brick (below); rear elevation in stucco (above).





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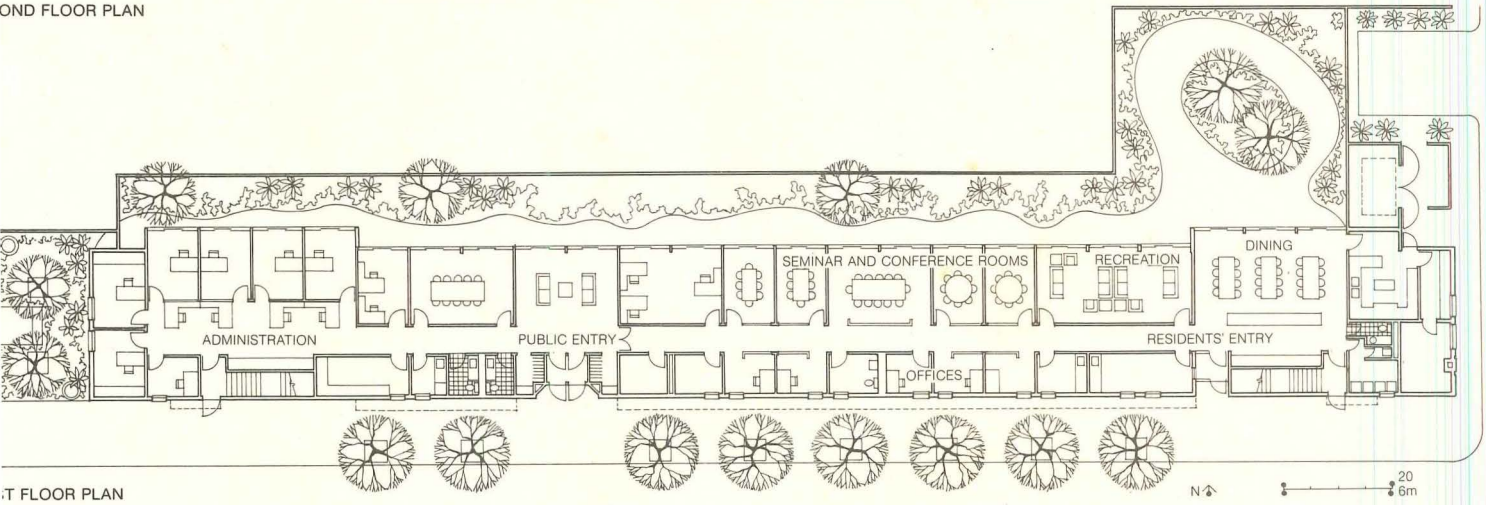

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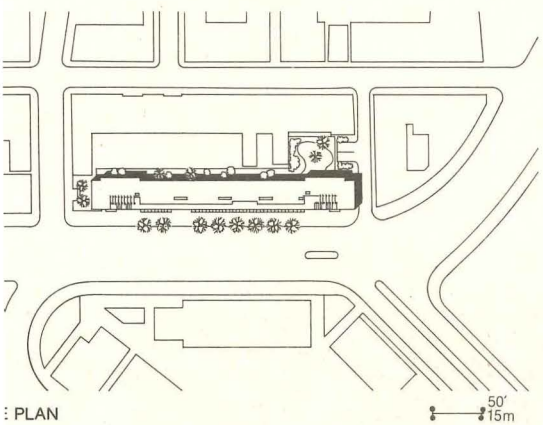

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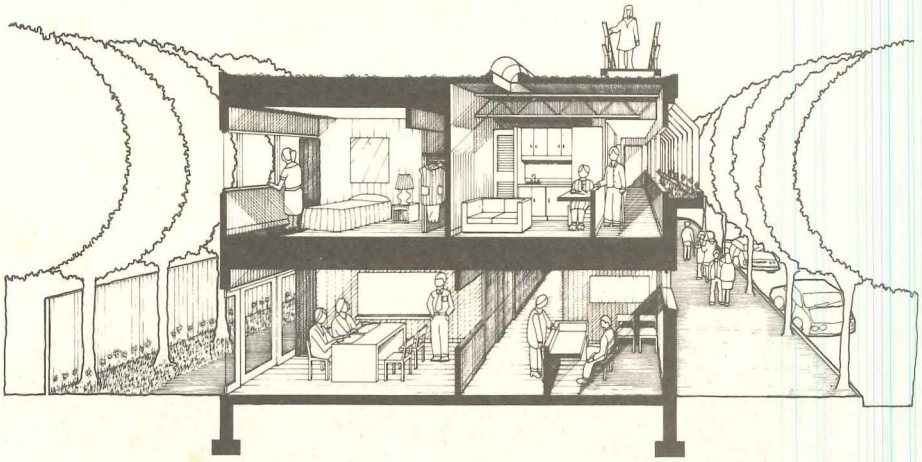


SECTIONAL PERSPECTIVE

Perceptual factors

Hidden barriers

Childlike motifs, institutional settings can both be psychologically debilitating. The environment can also deny sense of self.

Social, psychological and physiological factors all impinge upon the awareness of the handicapped, the elderly and the rest of us in experiencing architecture.

Although P/A is focusing on design for the physically handicapped in this issue, "barrier-free" architecture is not merely a matter of ramps, curb cuts and handrails. Its success will depend on how it performs on the mental level as much as the mobile level. With this group of users, perception and reception of a building's formal properties will tend to be judged on more subjective or emotional grounds than allowed those who can take their physical functioning for granted.

The messages a building conveys to its users involve more than a clarification of purpose or ease of access; they implicitly convey a society's attitude toward the handicapped and how the handicapped should in turn view themselves. It should come as little surprise to architects then that current theoretical approaches to architecture, such as analyzing the building as a system of signs, bears a strong relationship to barrier-free design. These approaches implicitly recognize that architecture communicates on more than a functional level; the nature of that communication becomes meaningful due to the social, psychological, and physiological factors affecting individual perception.

It is well known in the field of psychology that a person's self-image depends greatly on interaction with others and with the environment. As Edward Steinfield, James Duncan, and Paul Cardell point out in *Barrier-Free Environments* (Dowden, Hutchinson & Ross, Inc. 1977, Michael Bednar, ed.) design, space management, social organization, and social interaction are all factors that will impinge subtly and not so subtly on the development of a strong sense of worth.

Necessary to a handicapped person's self-image is the ability to manipulate the environment, not just orient oneself to it. Because of the frustration the disabled

commonly encounter in their attempts to explore the world, they may not try to adapt. Their sense of dependency increases; self-worth diminishes.

Researching the variables

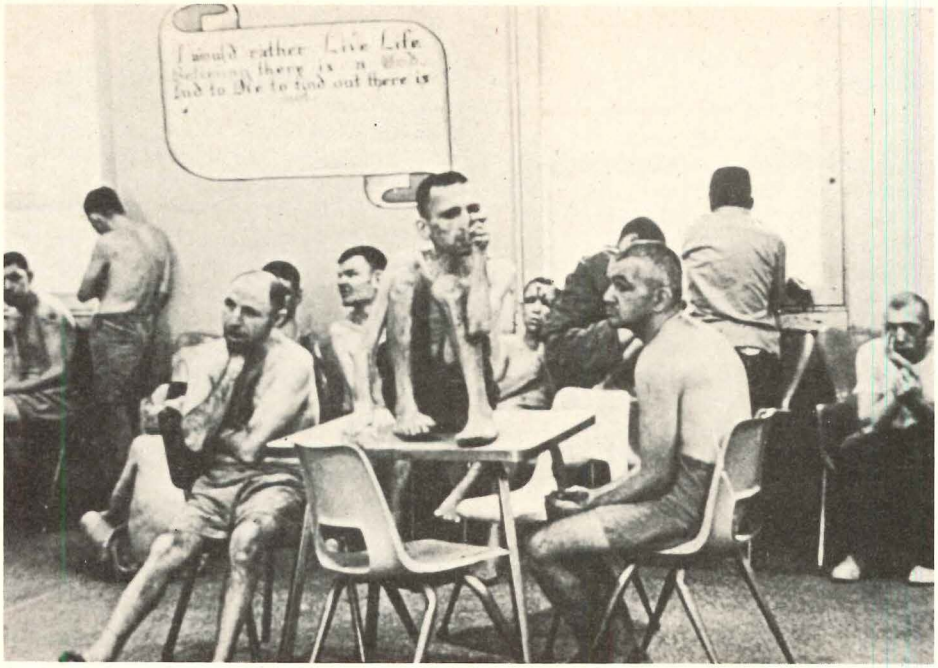
The research in the area of social and psychological aspects of barrier-free design has concentrated on the mentally handicapped and emotionally disturbed. Here the problems of perceiving the environment are the most acute; here the perceptions of a confusing setting are brought into sharpest relief. The lessons gleaned from work in this area, however, not only inform the design efforts of architects creating environments for the mentally retarded and emotionally disturbed, but the physically disabled, elderly—and the rest of us.

As architects working within this field are aware, the philosophy of "normalization" underlies current practices in therapy for the mentally retarded. The design attitude behind normalization shares certain characteristics with the more general architectural attitudes behind "post-modernism." While normalization relates to a whole system of therapeutic services, in design terms it seeks to overcome the alienating effects of the institutional environment much the same way that "post-modern" architectural principles seek to overcome the dehumanizing effects of modern architecture. In many cases they are synonymous. In terms of general goals, normalization encourages a "deviant" person to feel normal, to provoke an according shift in behavioral responses. Architecture, mirror of social and psychologically based attitudes and values, becomes one instrument for effecting this change in self-perception.

According to psychologist Wolf Wolfensberger in *Barrier-Free Environments,* for example, environments that are indestructible, with heavy-duty immovable furniture, high ceilings, recessed damage-proof light fixtures and wired glass are subliminal signs that the user is regarded as somewhat subhuman, a person with an animal mentality who needs supervision, not aesthetics. On a different tack, a clinical atmosphere of a service facility for the handicapped may reinforce the notion that they are diseased. As Wolfensberger observes, the ambiance and arrangement of services in the "clinic" type atmosphere seems to reassure one that a cure is being pursued at the same time suggesting that no cure is possible.

Similarly, handicapped people have long been viewed as objects of ridicule, and, in fact, the deformed and retarded were used to amuse the court during medieval times. Thus when service facilities for the handicapped incorporate clown, circus and jester motifs into their decor, a sort of cultural atavism seems implicit in these efforts.

Environments may also be designed to be overladen with paternalistic signs, experts in this area commonly agree. Ramps at every turn and overemphatic graphics are only some of the elements that scream



"this is a safe environment for the handicapped," reminds architect Clark Neuringer. This kind of architectural treatment, he maintains, further removes the handicapped physically and psychologically from the mainstream of interaction.

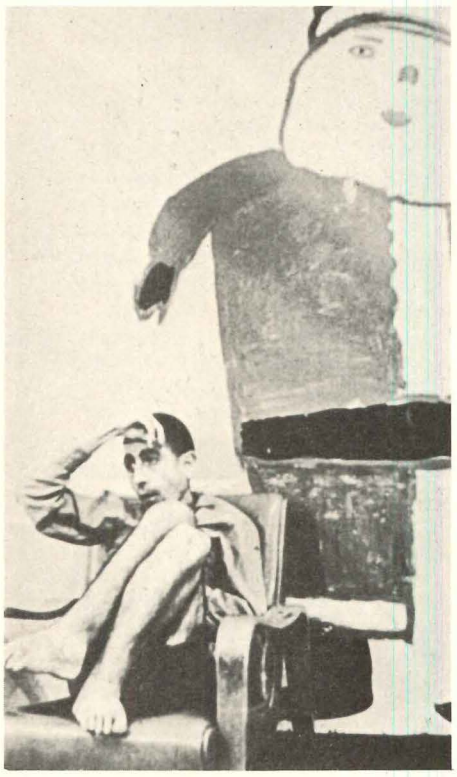
More pernicious perhaps is designing for the disabled as if they were children. Here Wolfensberger objects to environments for the retarded in which decorative motifs constantly reinforce this notion through overuse of pastel or bright colors, childlike drawings and murals, or holiday ornaments left up all year round.

Threshholds of awareness

Of the several defining features of buildings used by the handicapped, location is one of the most prevalent modes of communicating an attitude of society or the institution toward the disabled. Often service facilities, for "devalued" people, Wolfensberger observes, are placed near other devalued environments, such as cemeteries, garbage dumps, railroad tracks. Sometimes the isolation of the facility on a hill, in a rural area or on top of a high-rise, serves to underscore the association of the disabled with say, a colony of lepers.

The exterior design of the facility provides yet another level of subconsciously read associations—the building that looks like a warehouse is a too obvious case in point. "Recycled" buildings still giving off signs of their previous functions—signs that may conflict with or create ambiguities with the present role of the buildings—represent more subtle examples of this phenomenon. This kind of effect can be psychologically discouraging as well as disorienting to someone who needs to be able to read the environmental cues well.

The building should be psychologically as well as physically accessible for those who must expend a lot of their time and energy approaching the facility. General opinion often holds that accessibility for those entering and using the building can be reinforced and encouraged through an



Perceptual factors

ordering of architectural elements that is identifiable and familiar—that triggers associations with other buildings for similar purposes. Ambiguity has little place. But this conclusion does not mean that the building need resort to an abundance of graphic signs to tell visitors how to enter and where to go once inside, or that the architecture has to be flatfootedly unimaginative or aggressive in its design.

Wolfensberger warns against crude gestures toward ease of access, citing the example of a home converted into a service facility. While it blends with the surrounding residential neighborhood, an ugly, obtrusive ramp slammed against the side of the building or the fire alarm appended to the front announces that something "not normal" is occurring there.

The signs of internal space

The interior domain is generally viewed as most critical in conveying psychological messages to its users on a number of symbolic levels that can help or hinder them in developing and sustaining social identities. Wolfensberger feels particularly strongly that the interior design of the building in which handicapped people will be the prime users should be "culturally appropriate" as well as "age appropriate." A vocational center designed as a typical industrial environment may be appropriate in a general sense. But it may be *too* realistic for occupants who seek to bolster individual identities in a setting that reinforces the notion they are but cogs in a machine. Expression of purpose is one thing; expression of the user's role within that scheme of things adds another dimension.

"Homelike" settings have been advocated by psychiatrists for the treatment of the mentally retarded where lamps, chairs, carpeting, and plants in small-scale spaces would replace settings with hard surfaces, somber color schemes, industrial blinds, heavy-duty furnishings, long anonymous corridors, dormitory-style living spaces and so on. But it does matter how it is done. A homelike setting that looks like a child's nursery, Wolfensberger might add, communicates an attitude towards its users that can be debilitating to the fragilely-formed sense of self.

Built-in furnishings provide another case in point. A number of experts argue that built-in furnishings are not flexible, personally adaptable or conventionally "homelike." But again it's not so much what you do, but the way that you do it. Built-in furnishings need not be off-limits but they should allow for individual expression and privacy.

In sum, what Wolfensberger and others are promoting is the understanding of the ways a building is read by its users in terms of *their own experience*. The architect legitimately views the building from his or her own vantage point (including where it stands in relation to other architectural oeuvres). The client who commissions the building may see it from his or hers—how the building expresses the program, aids in the distribution of services, allows ease of maintenance. Meanwhile the disabled user may perceive the same building as incomprehensible in terms of its implied functions, intimidating in terms of his or her lack of familiarity with its formal devices, or alienating because of its size or institutional easy-to-clean surfaces. *Or* he or she may subconsciously register the building as condescending because its design elements overstate the solution to the problems they address; cloying because the architectural motifs are aimed at a group with which he or she does not want to be associated, or even banal, because the gestalt is too readily available to permit the adventure of individual adaptation.

Becoming what you behold

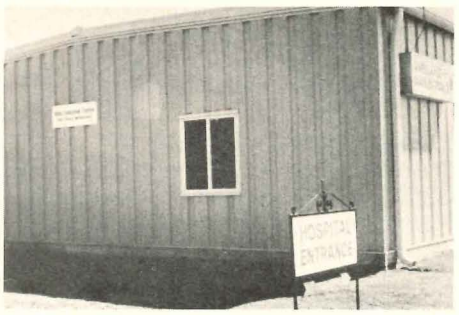
Most of us think ourselves immune to handicaps. Yet most of us someday will be elderly—if we live so long. And the problem is, we may. Advances in medicine are making it possible for more of us to live longer with and without severe handicaps. Gerontologist Leon Pastalan speculates that by 2000, 30 million Americans will be over 65; right now the figure is 22 million, or one in every ten.

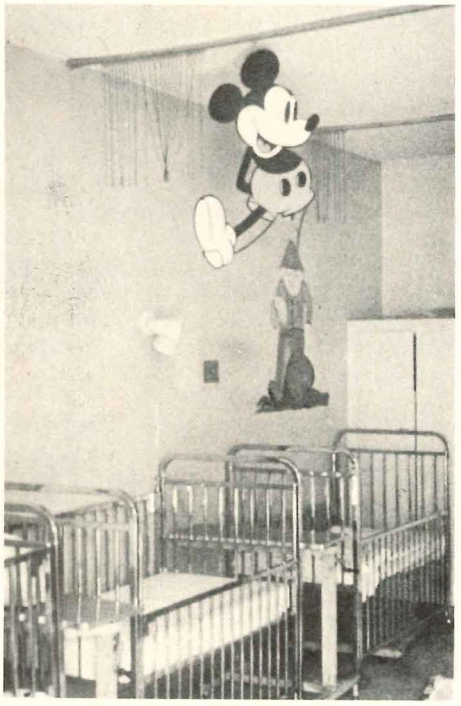
But just because we live longer doesn't mean we'll be out jogging every morning, turning out architecture in the afternoon, or writing treatises by night. If a good many of us aren't rolling around in wheelchairs, tottering about on canes and crutches, trying to remember what day it is (though we can't forget all the things we did on a day way back in '78), if we can avoid all that, we will still probably be afflicted by one thing very common to the elderly: loss of sensory perception. The physiological obstacles to perceiving the environment will greatly influence our social and psychological experience of it.

Because of sensory impairment and the loss of visual, tactile, aural levels of perception, the environment will be increasingly confusing and frustrating. Needless to say, the long corridor seems to extend to infinity for someone who can't see the end, or has trouble distinguishing the door to his or her destination. Pastalan, who is Director of Research for the Institute of Gerontology at the University of Michigan, finds age-related changes that occur to the human eye (important since 85 percent of the environmental information is visual) affect both acuity and opacity of the lens.

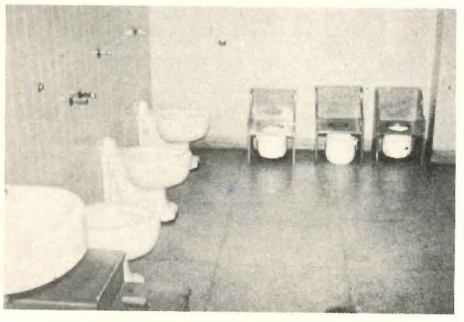
The visual acuity of the eye of course influences how we perceive objects at a distance. The opacity of the lens, however, determines the way light is transmitted, affecting perception of colors and textures. For example, Pastalan finds that the elderly see colors almost 20 percent less keenly than those with normal vision; particularly in the cold end of the spectrum. Colors too often blend, and closely related textures can't be differentiated.

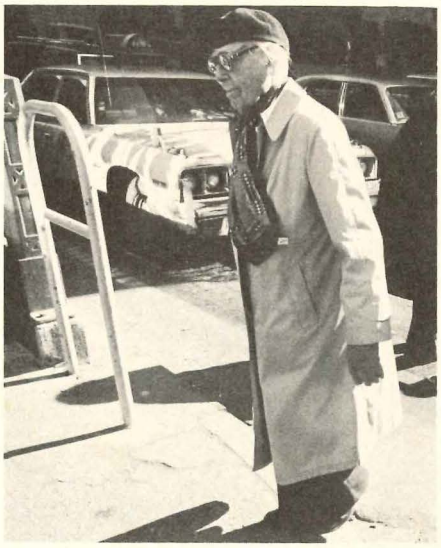
Glare is a major visual difficulty with the elderly. But Pastalan warns against the common tendency to confuse glare with light level. The light level must be in-



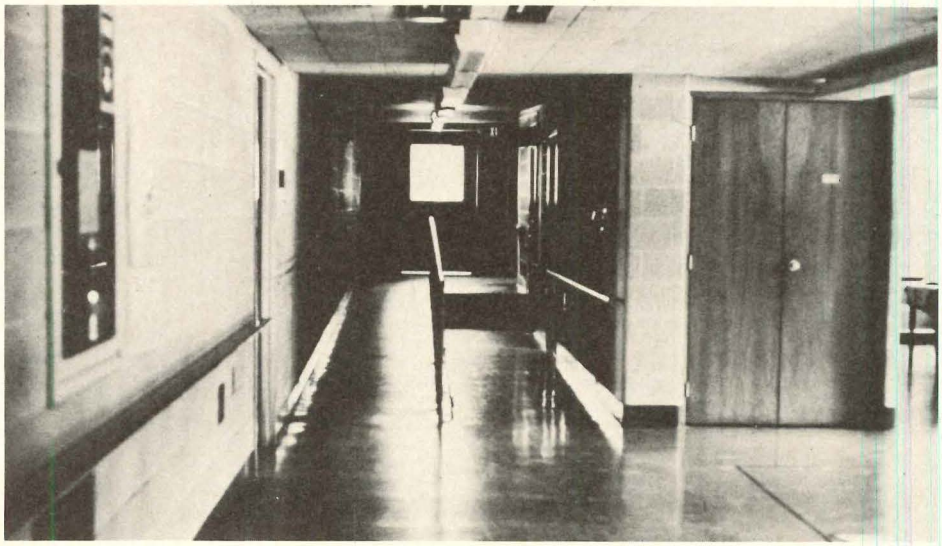


A senior citizen day activity center is housed in an industrial-like building (top); while a group residence occupying a former home has attention called to it by an unsightly ramp and fire bell (middle). In the photo above, Mickey Mouse decorations are ironically juxtaposed with cage-like beds in a depressing institutional setting. In the photo below toilets are grouped with no attention to certain normal amenities like seats, toilet paper . . . or privacy.



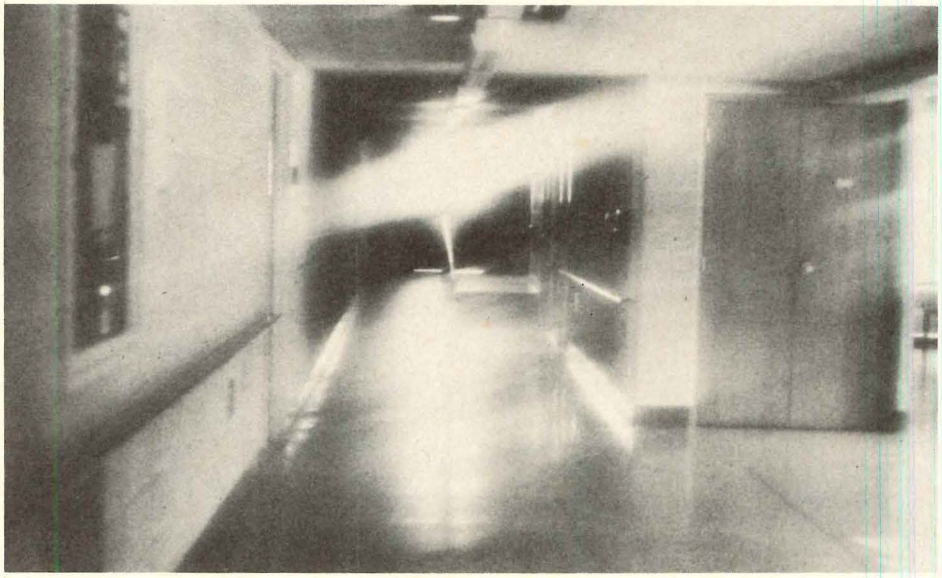


With age the loss of sensory perception can become serious handicap in getting around.



A hall as it is seen normally (above) and using Leon Pastalan's empathic model for elderly vision (below).

Photos: Dorothy Alexander



creased as the elderly get older and glare reduced. If a south-facing room is filled with natural light bouncing off shiny white surfaces, the glare of course will be intense; drawing the shades, however, will not solve the problem of needed light. Pastalan argues for balanced lighting between the natural and the artificial, the direct and indirect. Fluorescent lighting may in many cases be inappropriate for a homelike setting, but in a clothing store, for example, it does help in distinguishing blues and greens.

Aural considerations, of course, must not be forgotten. Again Pastalan points out, sound is not the problem—noise is. The elderly, in particular, have trouble distinguishing meaningful sounds. The background hum of heating and ventilating and air conditioning systems, easy for younger people to adapt to, along with television noises, children yelling, etc., need to be modified for the elderly who cannot differentiate between meaningful sounds. On the other hand, living in a world of silence would be psychologically harmful. (Sounds and textures assume different and even greater significance for the blind, a topic which there is not sufficient space to discuss fully here.)

To try to aid designers in understanding how the elderly perceive the environment through their senses, Pastalan has developed an "empathic model." Using already collected data on the opacity of the lens, the increased rigidity of the middle ear, diminished tactile and olfactory sensitivity, he has been able to simulate the experience through the use of mechanical appliances. The basic simulation is restricted to normal sensory losses for people about in their late seventies.

But the ramifications are immense. Pastalan finds that an environment should make use of redundant cuing to compensate for lessened sensory perception—through aural, visual and tactile stimuli that are all associated with a particular setting. Spaces also need to be organized with a certain amount of predictability. Again ambiguity has little place in the world of the elderly. As Pastalan adds "the usual subtle and complex architectural statements are not only largely unappreciated but are dysfunctional as well." For example, he explains, the elderly tend to bump into walls that are, say, light green in a room with blue-green carpeting owing to faulty perception of depth, colors, textures, and even contours.

This kind of research briefly discussed in these pages obviously presents a challenge to architects already designing for the disabled. No doubt that challenge will grow as the population of the handicapped and elderly increases. Yet as gerontologist M. Powell Lawton wrote in a recent issue of *Journal of Architectural Education* "the goal of environment design is to create situations that are modestly demanding on an individual without being excessively demanding." This goal, which affects old, young, physically impaired, and physically active people suggests that *balance* is the key word. The environment still must be challenging enough to be interesting, to engage the attention and participation of the occupant in adapting to it, trying to manipulate it, interacting with it. But it shouldn't be too disorienting, too aggressive, too demanding. The trick is to determine where to draw the line, how to design an environment in which there are no hidden barriers to its appreciation, but hidden delights, hidden richness, hidden (and healthy) meanings. [Suzanne Stephens]

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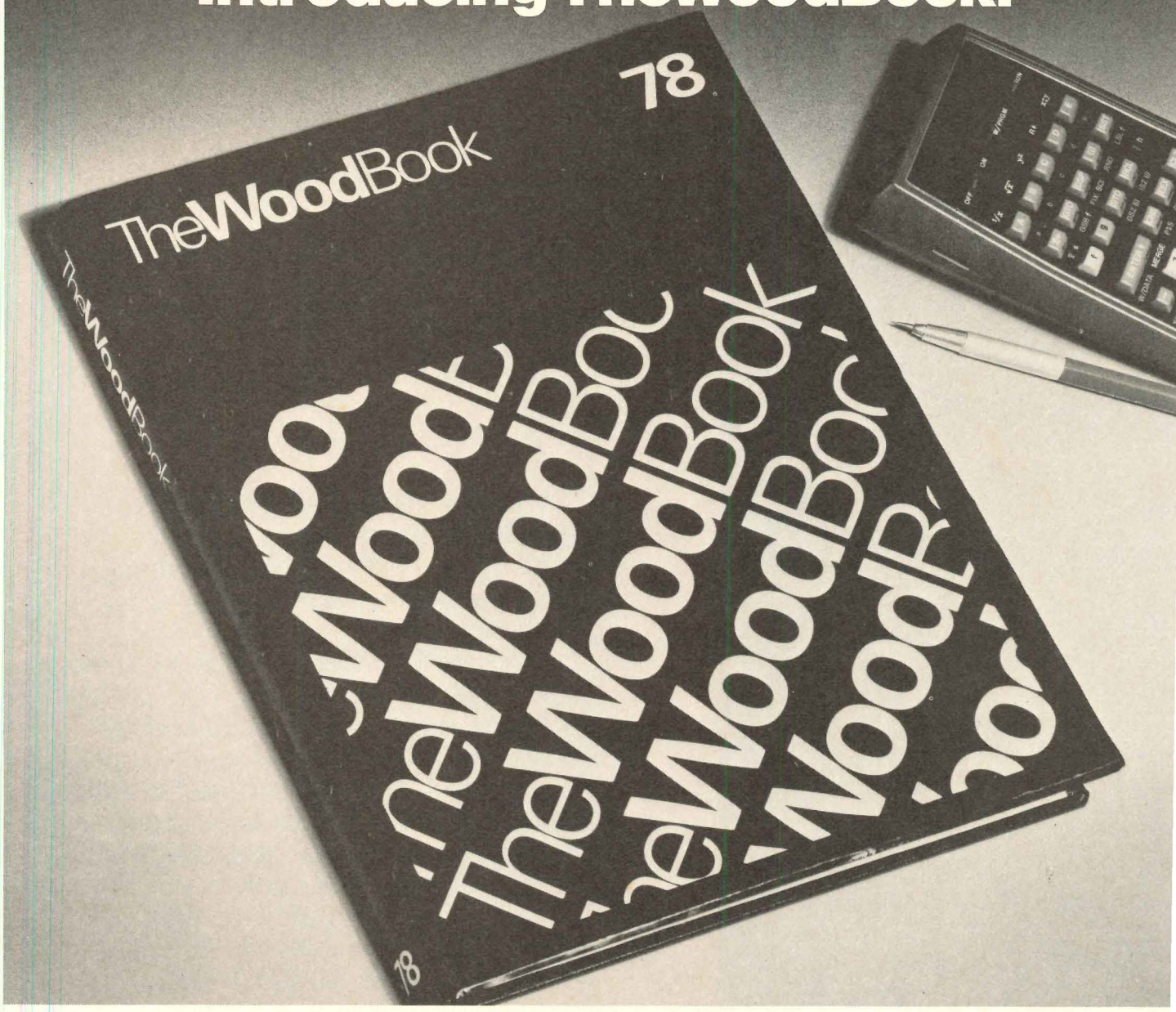

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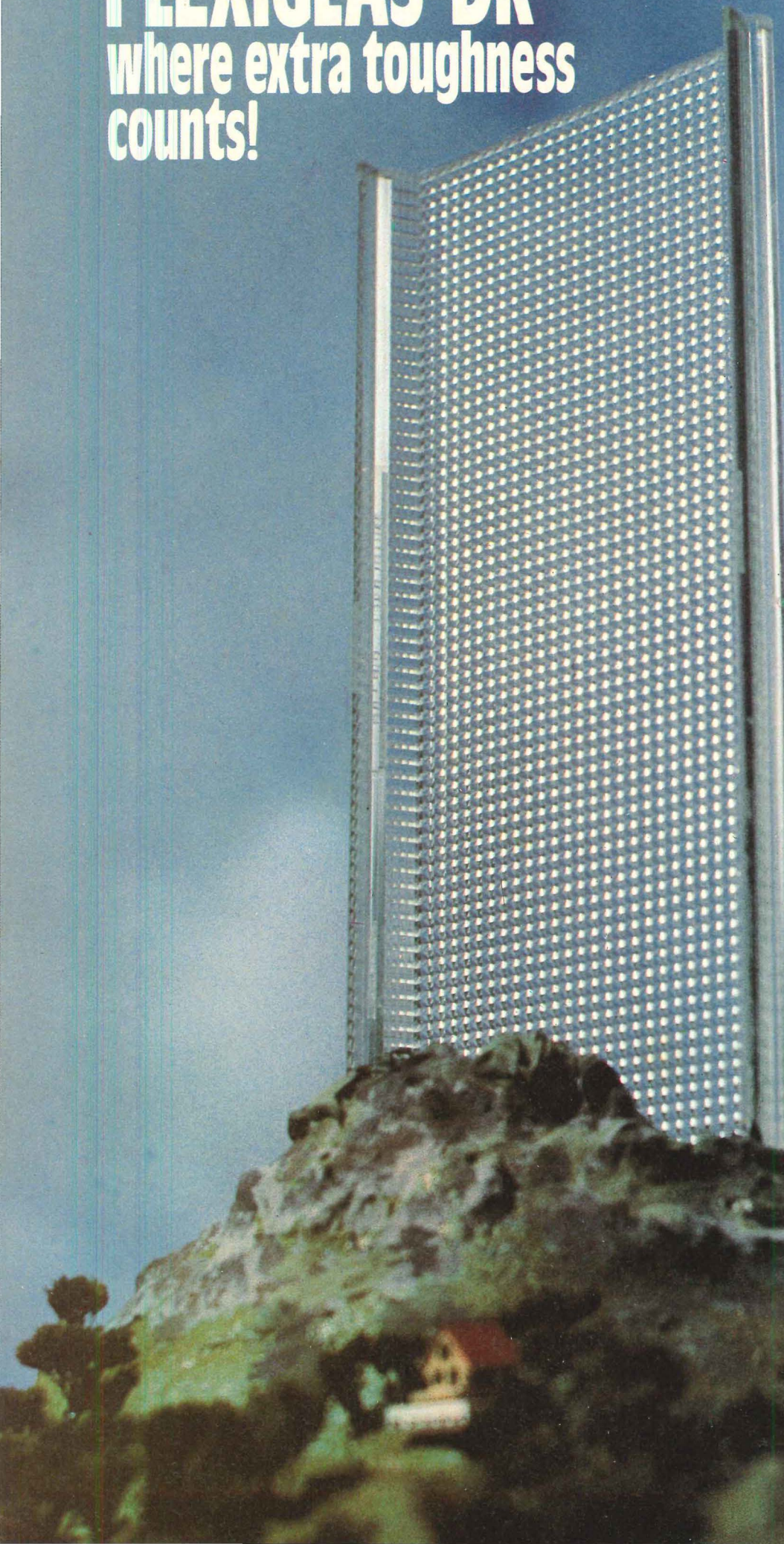

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Operation and maintenance manuals

Josephine H. Drummond

Compilation of operation and maintenance manuals is a complicated procedure which requires careful attention and coordination with many other Divisions.

At some time in his career, every project administrator and construction coordinator has received a torn, faded, and dusty roll of drawings with the words "As-Built" scribbled across the back. For a very simple project, the working drawings may be all the record he needs. Usually today's building projects contain dozens of systems comprising hundreds or thousands of components. The information necessary to the operation and maintenance of each component should be assembled while it is available, fresh in the minds of those involved.

The broad scope of the project closeout process includes obtaining record documents, operation and maintenance manuals, warranties and bonds, and spare parts and maintenance materials. If we are to avoid receiving a motley mountain of disorganized drawings, documents, catalog cuts, and specification sheets, spare parts and tools, we must specify the manner of submittal. Specifications should call for spare parts, extra materials, and tools and devices to be properly labeled and delivered to the owner's maintenance office, warehouse, or storeroom as appropriate. Warranties and bonds are usually sent to the architect for review and delivery to the owner.

Operation and maintenance manuals are probably the most complex item of the closeout process, since a diverse assembly of miscellaneous data must somehow be organized into a useable and complete reference document. Generally, manuals will be required for each building system and for each item where special instructions are in order. Obvious examples are the mechanical and electrical systems, vertical and horizontal transportation, equipment of all types, and many specialty items. Less obvious, but equally important, are instructions for maintaining wood paneling, for adjusting the computer floor panels, replacing fusible links in smoke vents and fire shutters, adjusting drop seals on doors, and tension on door closers. Attempting to prepare a comprehensive list would probably result in omissions of important items. The use of Division 1 in conjunction with every other Division which has items requiring manuals provides a convenient procedure.

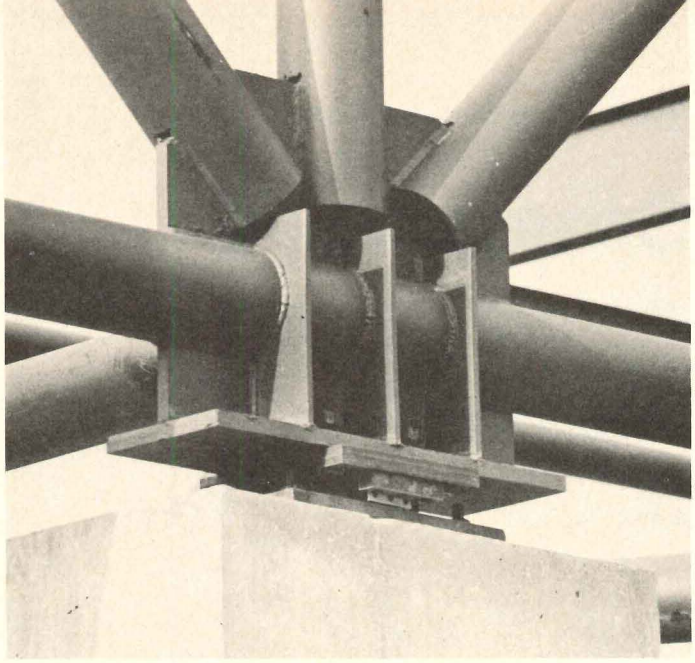
In Division 1 details of how to prepare and submit the manuals, how many and when to submit them are specified. In each of the technical sections as applicable, items to be covered in the manuals, or more generally manuals for all materials and equipment furnished under a given Division or Section are specified. A simple cross reference to Division 1 automatically covers the submittal procedure. Where some or all of Divisions 2 through 16 are prepared by others careful coordination is required to avoid redundant or conflicting requirements. Division 1 should define whether the manuals are to be looseleaf or spiral bound, the size and number of copies, the type of cover. Whether each system is to be covered in a separate volume, or whether one volume with dividers is preferred, and if the manuals are to consist of a number of volumes identical in appearance, this must be specified.

Each manual should begin with a title page to indicate what it covers, and when and by whom it was prepared. A table of contents should outline what is included and where to find it. A directory should follow, listing cognizant persons, manufacturers and distributors, with their addresses and telephone numbers. From here on the sequence and scope become somewhat optional and varied to fit each system or component. Spare parts lists, maintenance schedules, operation sequences and methods, shutdown and start-up procedures, wiring and control diagrams, and instructions are but a few of the possibilities. Shop drawings and record copies of the contract drawings may be included. These may be very bulky, so consideration may be given to photo-reduction for ease of insertion. Manufacturers frequently pack an odd-sized sheet or booklet of installation and maintenance recommendations with the item. Specifications should clarify how these are to be handled in the manuals. They can either be identified and placed in pockets or reproduced onto standard sized sheets. Where a project includes a control room or equipment system which is also a public display, special consideration should be given to the presentation of manuals and drawings. Graphic renditions of operating sequences or flow diagrams may be laminated in plastic or framed and mounted on the wall. These may be very elaborate, incorporating lights, flow indicators, clocks, and recorders. Manuals may be bound in leather and placed on display shelves. The cost of these amenities requires that they be carefully specified.

The manuals should be submitted in time for review and acceptance prior to application for final payment. If special or expensive presentations are involved, specifications should require a draft or mockup of the manual to be submitted for review prior to preparation of the actual documents. Timely and properly prepared manuals can simplify the owner's initial operation of his facility. Thoughtfully prepared specifications can help make this a reality. □

Author: Josephine H. Drummond, CSI, is Manager, Southern Premises, Real Property Management Department, Wells Fargo Bank and is a specifications consultant in private practice.

Innovation in steel



Matthys Levi

Detail, Motorgate, Kalman, McKinnel & Wood, Architects

Innovative fire protection and production of steel I beams, coupled with a promising new framing idea, led William LeBarron Jenney to the "skyscraper." Nearly 100 years have passed, yet innovation in steel continues to promise a fresh response.

To map the large expanse of knowledge and experience that is the steel industry, we began with an interview of engineering staff members at the New York office of Weidlinger Associates. Paul Weidlinger, internationally acclaimed engineer, author, and scholar has piloted his office to the frontiers of engineering knowledge and practice. A partner in the office is Mario Salvadori, whose books on structures and applied mathematics have been translated into 12 languages. Every architectural student in the country owns at least one of his texts. Matthys Levy has co-authored a book on structural analysis with Salvadori. Interviewing this bevy of engineering brains is like trying to pitch a knuckle ball to the top of the Yankee batting order.

The topic of conversation was innovation. Innovation is the by-product of the necessity to change. If the problem and methods of solution remain static, the solution itself is likely to lack innovation. If either the problem or its method of solution changes, or both, innovation is nearly guaranteed.

The relationship between the engineer and the architect has changed. As Salvadori expressed it: "Economics have changed the role of the engineer vis-à-vis the architect. Until 10 to 15 years ago, I was not asked by an architect, I was summoned to his office, and I was told what to do. Nowadays, we are lucky in this office, we only work with the very best architects, we don't accept to start working on a project unless we can start from the very beginning, and the structure and the architecture grow together in an organic and intelligent and therefore economic way."

Cooperative action is the key. Traditional stratifications of materials, products, and professions dissolve in the flow of ideas. Teamwork is the result. Half of Weidlinger's office is devoted to computer specialists. Air-supported cable structures, for example, require a mechanical engineer and structural engineer to feed their knowledge into a computer to yield the variety of shapes from which the architect can choose. The roof fabricator and three manufacturers form the team which provides the fabric spanning between steel cables. Water-filled columns used as fire protection also require a new marriage of talents. The structural engineer is unversed in hydraulics, the mechanical engineer is shy with steel. A new professional is born.

Educational institutions play no small role in the process of creative invention. Dr. Lynn Beedle, director of the Fritz Engineering Lab at Lehigh University also directs The Council on Tall Buildings and Urban Habitat. This council is sponsored by, among others, the AIA, AIP, ASCE, and has financial support from the National Science Foundation and the American Iron and Steel Institute (AISI). For him, the most unexpected result of his committee has been the new-found interplay and cooperation between disciplines. Architects, engineers, sociologists, and planners all meet, seemingly for the first time, and try to find a common vocabulary.

Cooperative effort with an architect requires for Mario Salvadori a particular kind of empathy. "It seems to me that if the architect is the kind of person who is imbued with a feeling for structure, not a knowledge of but a feeling for structure, and if the relationship with the engineer is sympathetic . . . very often what comes out is both formwise and structurewise among the best."

This is not to say that the architect has been relinquishing responsibility for formal decisions to the structural engineer. On the contrary, it is rare that structural decision-making is solely a question of structural efficiency. Fast-tracking methods, manpower availability for construction, and building energy considerations frequently override the best structural solution. The architect is therefore left with the responsibility for evaluating the interrelationship. The total process of designing, constructing, and occupying the building must be as economical and rapid as possible. As Matthys Levy succinctly puts it: "The challenge is to design with a set of ground rules which have become more and more specific."

Innovation update
One innovation that engineers have helped to bring about in the last 15 years is the very tall building. A society which reached the moon by rocket seemed intent upon also accomplishing that feat by elevator. The Hancock building and Sears Tower in Chicago and New York's World Trade Center are all brilliant inventions in steel. The engineering limits of tall buildings have not been reached. Steel can go higher, elevators and mechanical systems have a more difficult time. People, however, are seeking other goals. Salvadori feels that "the spirit of the culture has changed. The era of the 110-story tower is finished." Dr. Beedle believes that a new era more responsive to municipal planning is at hand. The innovations in tall buildings most probably will come both from the U.S. and from other countries that can benefit from our knowledge, and our mistakes.

Where then will the innovation in steel structures occur? Salvadori believes: "If there are any changes that are coming about, they will be in what looks to the layman like minor details. I think that today in steel structures the problem of the joint is really the problem."

Details: "Steel is not a material," says Roger Wildt of Bethlehem Steel, "it is a word like 'building.' We have ten thousand of them and could invent ten thousand more if we need them." Improved understanding of steel behavior in the last 25 years has meant taking advantage of its ductile properties. New steels benefit from this research. In spite of the vast number of different types of steel which have been invented, in building construction we still use a predominance of A36 carbon steel. 50 KSI steel is now the most cost efficient, if you can use the strength and handle the deflections. 100 KSI high-strength steel is used in tall building columns where extremely high stress levels are necessary. While the material itself seems unchanged, this fall we will see some new shapes.

As of September 1, 1978, several traditional shapes will no longer be produced. The purpose is to make the variety of shapes more logical in sequence and also to eliminate sections which are more costly to roll. The immediate effect on architects could be confusion. If your engineer has specified a beam which will no longer be produced, chances are the beam that replaces it will have different dimensions. If the beam size retains its name and weight, the dimensional change is miniscule. If the steel for your project is to be delivered later than September 1, ask your engineer to make sure the shapes you have chosen have not been affected.

Staggered truss: This system was developed in the mid-1960s at MIT as a joint project of the Architecture and Civil Engineering Departments, sponsored by the US Steel Corporation. Floor-to-floor height trusses occur at alternating floors. The trusses span the building at alternating column lines. Floors span from top and bottom chords and take horizontal load across the building, reducing the bending in the columns. The result is columnless space, particularly suited—though not limited—to apartment scale projects.

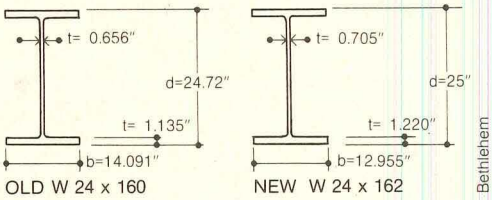
Use of the system in the last decade has proven it to be economical and versatile above eight stories in height and in buildings of greater width than 45 ft. The greatest economy, of course, can be accomplished by beginning with the staggered truss concept and adopting an appropriate module.

Interstitial space: By alternating normal hospital use floors with a mechanical level deep enough to walk through, interstitial systems can provide flexible floor plans as well as complete freedom to alter mechanical systems. The first examples of the sandwiched spatial organization occurred in the late 1960s, not in hospitals but in laboratories, the most famous of which was Kahn's Salk Institute Laboratories. "Interstitial space"—from interstice—is a term referring to spaces between things.

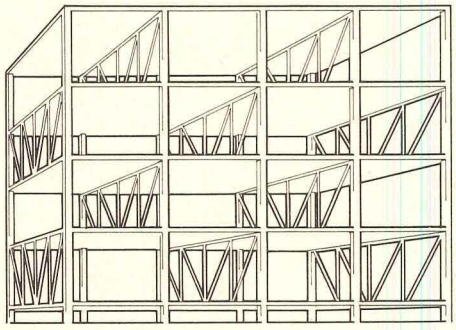
Hospitals have always meant a complex interface between elaborate programmatic requirements and complicated mechanical services to serve them. In recent years the rapid developments on both sides of the problem have introduced a time factor which demands flexibility, variety, and change within the lifespan of the building, not to mention in its design. Hospitals which use steel to accomplish this task have frequently turned to full-height steel trusses on the mechanical floors. Interstitial systems are not the lightest weight, least expensive structure. When fast tracking methods are used, however, an attractive economical package of programming potential is the result. Over 50 hospitals using interstitial space have been built in the last decade. (See P/A, July 1972.)

Stub girders: The stub girder is an innovation involving more than just a single structural element. In fact, stub girders are a three-dimensional concept which incorporates transverse beams as well as ductwork and composite action between girders, the steel deck, and lightweight concrete floor. Engineer Joseph Colaco of Houston, the originator of the idea, explains the system as follows: "The system consists of a girder spaced approximately 30 ft on centers and spanning between the core and an exterior column. This girder consists of a high-strength wide flange beam with stub pieces shop welded onto the top flange. Floor beams are placed over the girder (between the stub pieces) at approximately 10 ft on centers. The system is completed by the placement of a lightweight concrete slab on metal deck spanning the floor beams. Composite action is ensured by the provision of shear connectors."

Allowing the floor beams to rest on the girders means that the ends of successive beams can be spliced together at points of zero moment on the beam line. The result is to gain the beam depth advantage which always accompanies cantilevers. The combination of composite action, continuity, and engineering genius reduces the structural steel in the floor by 25 per-



OLD W 24 x 160 NEW W 24 x 162
Bethlehem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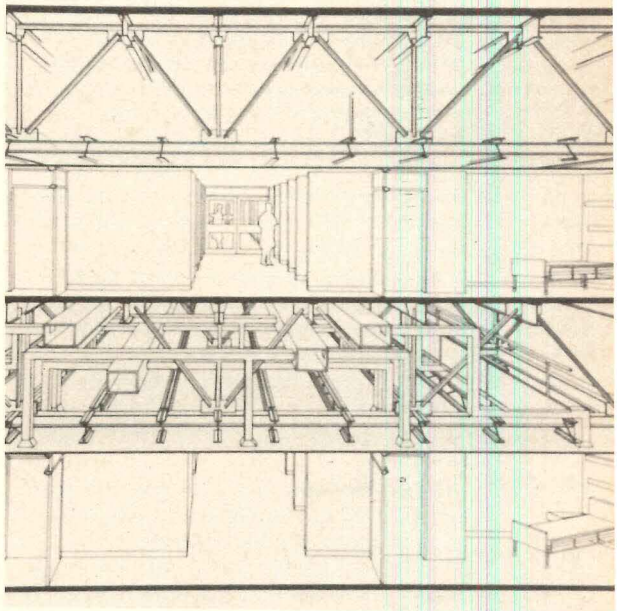
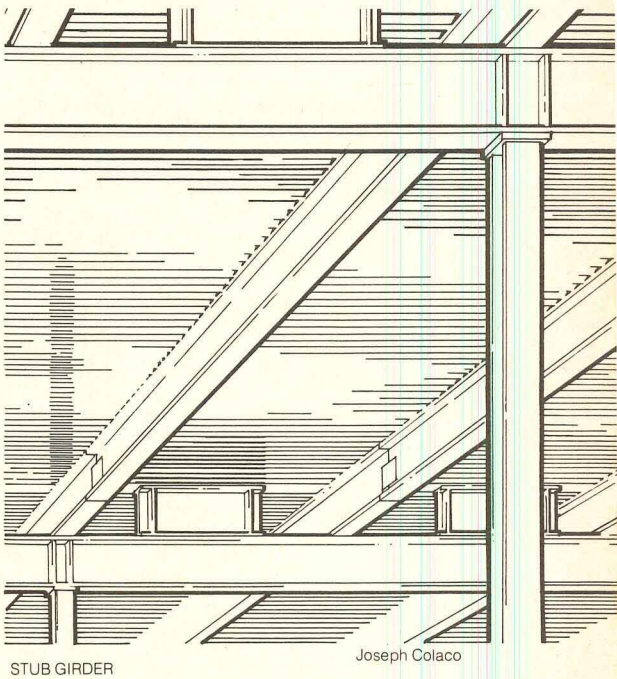
STAGGERED TRUSS SYSTEM


INTERSTITIAL SPACE AISI


Joseph Colaco
STUB GIRDER

cent, and the floor height by approximately 8 in. Stub girders have been found to be most advantageous in buildings whose width exceeds 100 ft and which can profit from 35 ft to 40 ft clear spans.

The first use of the stub girder was in 1970. Since then it has seen considerable service in office buildings and the most recent applications include university buildings and hospitals. Perhaps the most architecturally significant application to date has been Pennzoil Place in Houston by Johnson/Burgee (P/A, Aug. 1977, p. 66).

Castellated beams: Used widely in developing countries to remedy limited access to steel shapes, castellated beams have begun to see greater acceptance in this country as well. As the name suggests, an I beam is cut lengthwise in the beam web resulting in two halves which resemble in profile the battlements of a castle. The two halves are then welded by their "teeth" producing a deeper section. Lighter than an equivalent I section, the beam already has hexagonal holes neatly patterned in the web. The two halves need not be cut from the same original beam. The designer is free to use a lightweight section in the top and a heavier section in the bottom. Coupled with embedding the top flange in the concrete floor above, post-tensioning the concrete, and use of removable forms, the system has proven itself to be an attractive and economical solution to parking garage construction. It has also proven to be cost competitive where the structure is concealed and lightweight roof construction is desirable.

Space frames: In the U.S., the idea of a mass-produced prefabricated modular space frame was first developed by architect-inventor Charles Attwood in the early 1950s. First used at the University of Michigan. The system was thoroughly tested in full-scale mockups. Design calculations were carefully checked and all the standards for light-gauge steel construction were met. The individual light-gauge components were designed to safety factor of 2 (1.6 is the normal requirement in tension and compression of heavy-gauge structural steel.) When it was finally marketed in 1965, Attwood's design still was based on testing. Computer analysis was too expensive. Since 1972, improved cost effectiveness and availability of computers has made an in-house computer a reality with some companies. Designers insist upon verifying every calculation with their original test results, but they find that they are able to tackle intriguing shapes and geometries which were impossible before.

Other innovative modular space frame systems have since emerged. A 3000-sq-ft space frame roof was used recently at the Visitor's Pavilion, United States Coast Guard Academy in New London, Ct. The tube elements are square and boast a speedy field assembly and erection time. The roof was lifted into place with only a single crane.

Cold rolled: One of the least commonly used, yet most ingenious properties of steel is its gain in strength as thin flat sheets are bent and formed to assume more structurally advantageous geometries. "Strain hardening" during the forming process can actually increase the strength of already high strength steel.

Structural load-bearing steel stud construction has already made inroads into the low-rise housing market. Research is being conducted now into the fire technology and structural performance. The result will mean the use of load-bearing steel stud construction in more varied building types.

Recently, the American Welding Society (AWS) has written a new code pertaining to fusion welding of thin steels. It becomes much easier to calculate and design the weld strength of such welds and promises to make on-site welding of load-bearing steel studs and joists common practice.

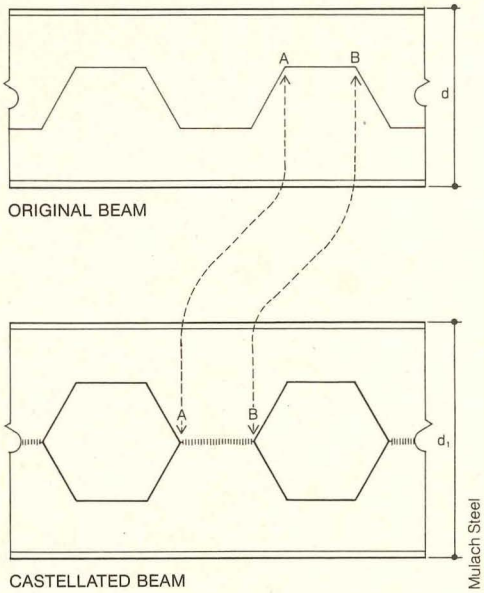
Cold-formed paneling and decking has also increased in use in the last decade. Composite action between steel deck and lightweight concrete is especially useful in seismic zones. Foam-filled steel panels are assuming their proper innovative role in buildings. Cold-rolled steel wall panels help keep Pontiac Stadium airtight.

Steel fire doors and their frames are cold-rolled. AISI and the gypsum manufacturers are working in tandem to increase understanding of the fire properties of the common combination of these materials.

Fresh fruit

As Mario Salvadori suggests, much of the invention and research in steel today involves connections. In some cases, the results will be invisible even to architects. Dr. Ralph M. Richard at the University of Arizona is sponsored by the American Iron and Steel Institute (AISI) in studying shear tab connections through computer analysis. Shear tabs are steel plates welded to columns or beams which eventually provide the bolted connection surface for wide flange sections. The outcome of the research could result in greater economy of material and more accurate production of the connection behavior. Dr. Kurt H. Gerstle is engaged in a similar type of AISI-sponsored project at the University of Colorado. His studies involve computer-simulating "soft" (Type II) connections. These connections are purposely designed as resilient. Improving connection design knowledge is expected to greatly increase accuracy in beam and column design, and reduce the cost of framing in steel.

Recent research work in bolt strength will have a significant effect on the design of bolted connections. Robert Disque of AISC explains that present code specifications will soon be altered. Says Disque: "Allowable shear stress in bolted connections has been increased in varying degrees up to twice its present value, depending upon the surface conditions of the bolted parts."



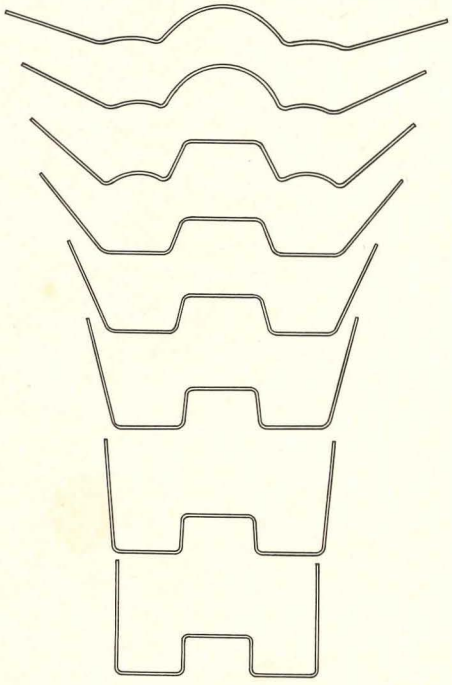
ORIGINAL BEAM

CASTELLATED BEAM

Mulach Steel


Unistrut

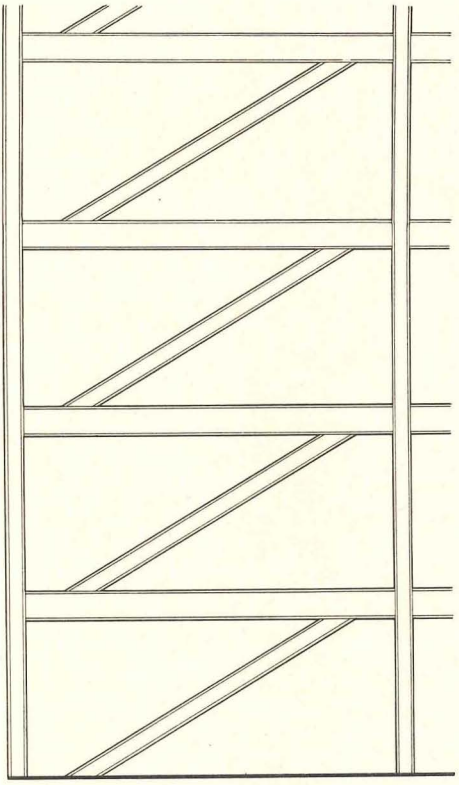
Space frame is used for handsome effect in the Muskegon Mall, by Landman-Andrews, architects.


AISI

TYPICAL COLD ROLLED SHAPING

Eccentric bracing: The 1933 Long Beach earthquake triggered concern about building codes—as related to seismic loads. Testing and research for this condition began in the 1940s. Recent developments in computer analysis have provided us with a tool with which we can quickly and accurately evaluate a number of alternate structural systems under seismic loads.

At present, two alternatives are in common use as steel framing systems. The rigid frame uses moment resistant connections to counter horizontal forces acting on the building. The braced frame uses diagonals for the same purpose and avoids bending in the frame. In seismic zones neither system has proven to be ideal. Rigid moment-resisting frames are flexible and therefore very effective for dissipating the energy transferred to the structure by the seismic load, but become expensive meeting drift or deflection requirements. Nonstructural damage to such buildings from earthquakes has proven to be costly. Braced frames can easily meet deformation requirements but have difficulty absorbing and dissipating the energy. The braced frame, until now, has followed the traditional geometry of a truss and used diagonals to span from corner to corner of the pinned rectangular frame. Tests of this solution have frequently resulted in buckling of the cross brace.

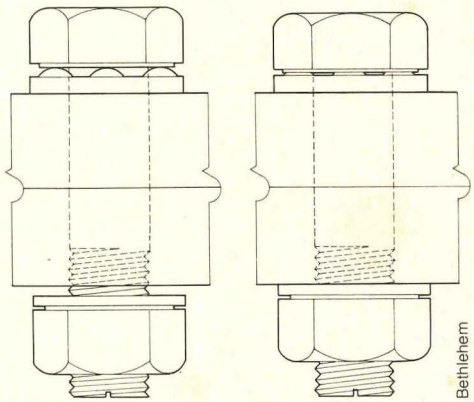


FREEBODY OF TEST FRAME

Several Bay Area engineers are suggesting an alternative that appears to contain the best of both worlds. The frame is braced by a diagonal, but rather than spanning from corner to corner, it is located approximately twice the member depth from the column faces and connects beam to beam. In so doing, the diagonal is designed as rigid and the shock is absorbed in the beams. Web stiffeners may be used at the rigid joint of beam and diagonal to avoid shear failure in the beam web. A "hinge" is allowed to form in the beam at the connection, giving the frame back its resilience.

Loring A. Wyllie and Henry Degenkolb of Henry Degenkolb & Associates in San Francisco were the first to suggest the use of such connections in two projects as yet unbuilt. Professor Egor Popov and Charles Roeder of the University of California at Berkeley have been testing the concept in the laboratory under sponsorship of AISI and the National Science Foundation. The idea has yet to be applied in practice. The projects which have been suggested are in the 30-story height range and show great promise structurally and economically. Other geometries lend themselves to the same design philosophy.

The load indicator washer: The load indicator washer is one of those "now why didn't I think of that" gismos which has turned a can of worms into a piece of cake. Ever since high-strength bolts have replaced rivets in buildings, the can of worms has been the procedure for verifying the tightened load on the bolt. In conventional practice all concerned must agree to the method of tightening the bolt as well as the method of verifying the torque that has been applied. It is a time-consuming and aggravating job. The load indicator washer originated in England where it has been in use for ten years. It looks like any other washer except it has a set of raised protrusions on one face, symmetrically arranged around the hole. The metal is soft enough so that when the bolt is tightened, the raised bumps are flattened. The more the bolt is tightened, the less space remains between the bolt head and the washer face. When a feeler gauge 0.015 in. in thickness will not fit in the space the required bolt tension has been achieved. The load indicator washer saves considerable time in the field and increases the predictability of the bolt's tensile stress. The result is increased safety of the bolted connection. Salvadori has just used the device on the bolted connections for Long Library, Columbia University.



Bethlehem

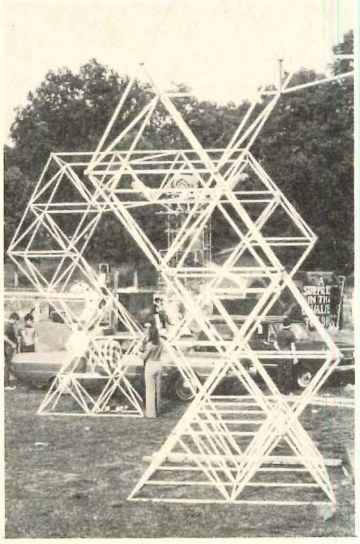
LOAD INDICATOR WASHER

Fresher fruit

Steel is "born in fire." Its Achilles tendon is also fire. Fire protection of steel has proved to be a costly and frustrating problem. In the mid-1960s, up to 18 percent of the in-place cost of steel was fire protection. Applied fireproofing products were replacing concrete encasement as the most economical protection. Steel companies were growing concerned about competition for the high-rise market. Several severe fires in New York and elsewhere resulted in misleading publicity that put steel at a disadvantage.

In May of 1965, US Steel started negotiations for design and construction of their new corporate headquarters in Pittsburgh. The building provided a perfect opportunity for innovation in fire protection of steel. By the end of construction, use of liquid-filled columns had saved US Steel an estimated $1 million over costs of a conventional fireproofing approach. The assault on fire protection of exterior steel had only just begun.

Liquid-filled update: A patent was first awarded for liquid-filled columns in the US in 1884. It took nearly one hundred years before the first example was built. The liquid in the columns is not just water; antifreeze must be added in cold climates and rust inhibiter is recommended. Since US



A result of AISI's "Hands on Steel" program is the homecoming display by Clemson's architecture students. It was built to rival the traditional chicken wire-and-napkin assemblies. Aimed at helping students understand steel and its properties, the AISI program is open to each accredited architecture school. In this case, a series of space-frame components is purchased; however, in other instances schools have been given assistance in the form of welding equipment or expertise, and/or help in obtaining steel from the closest supplier.

Steel built its headquarters in Pittsburgh, about a dozen buildings have been built both in the US and abroad. Harry Weese's Mercantile Bank Tower in Kansas City has liquid-filled columns at the base and uses flame shielding in the exterior structure on the main body of the building.

The Michelson Plaza Office in Newport Beach, Ca, by Bissell August Associates, has both liquid-filled columns and a set of liquid-filled beams supporting the roof. Liquid-filling does not apply to beams very successfully. When the beam heats up in a fire, the hot water needs to rise and cause fresh water to circulate into the beam. This means the top surface of the beam must be pitched. London's Ove Arup & Partners solved this problem handsomely in the Bush Lane House in London, with a cast stainless steel lattice made up of liquid-filled hollow tubes. The entire exterior structure is fire protected; there are no exterior beams. Water-filled columns have even been used to replace masonry columns in a renovation project on the Champs Elysèes offices of the French National Railways. The most recent and striking application, of course, is the Centre Pompidou in Paris. The water-filled interior columns help accentuate the theme of structural clarity, breathing "high tech" into the building's veins.

Parking structures: The thrust towards more appropriate fire protection of steel has resulted in major reforms in fire protection of exposed steel in parking structures. Records of fires in these structures were amassed and evaluated. The discovery was made that very little damage occurs to steel in open parking structures in the presence of burning cars. Tests were conducted in an actual parking structure in Scranton, Pa, in 1972. The result was a change in the fire protection requirements for exposed steel in open parking structures allowing unprotected steel framing to be used.

The Detroit firm of Albert Kahn Associates was the first to design and construct a parking structure following the new requirements. Actually, the building was approved prior to the (BOCA) code change, but permission was granted in anticipation of the new rules. The First-Bagley Parking Structure covers a city block of Motown, holds 1523 cars and uses weathering steel to drive home its point.

Just recently, the National Air and Space Museum in Washington, DC broke through still another barrier by protecting its exposed steel basement parking structure with a sprinkler system. The sprinklers are trained on the source of combustible material, which reduces the exposure of beams to heat. This part of the structure is below the museum, so architects Hellmuth, Obata, and Kassabaum avoided an expensive change in the structural material in the parking base of the building. Le Messurier Associates did the innovative structural design, and Rolf Jensen was the fire protection consultant.

Bethlehem

Scranton fire test to measure damage to exposed steel in a typical parking structure.

Flame shielding: On October 10, 1968, Underwriters' Laboratories conducted tests for US Steel at the American Bridge Plant in Trenton, NJ. The purpose of the test was to verify predictions of the fire protection engineers that exterior steel could be left exposed in high-rise buildings. As long as the surfaces in contact with the flames were adequately protected, they can shield the exposed steel from the flames. The process was called "flame shielding." The tests demonstrated that the beams used would not achieve the critical temperature that would cause dangerous distortion or failure. One result of these tests was One Liberty Plaza in New York. SOM was the architect and Paul Weidlinger was the structural engineer. (Weiskopf and Pickworth were the consulting engineers).

The hot news

Since those early pioneering efforts, liquid-filled columns and flame shielding have been successfully used both in this country and abroad for all sizes and types of buildings. The American Iron and Steel Institute is about to make available a summary of work on the subject of fire protecting exterior steel which has been prepared in England by Ove Arup & Partners. The report serves to gather information from all over the world on the protection of exposed steel. The AISI project is called "Design Method for Fire Safe Structural Steel" or "FS3."

Why Ove Arup? Two or three years ago, they became involved in two buildings—the Bush Lane House and Centre Pompidou—which use principles of exposed fire protected steel. They wrote to US Steel concerning Bush Lane and reached Larry Siegel, the USS fire protection mastermind for both the liquid-filled (US Steel building) and the flame-shielded (One Liberty Plaza) systems. Soon they began corresponding about Centre Pompidou. Not many people in this country realize that Centre Pompidou (P/A, May 1977, p. 84) is an orchestration of every available type of fire protection. Its columns are liquid-filled, its exterior is flame-shielded, its trusses are encased. By the end of the two projects, Ove Arup & Partners had employed Margaret Law, probably Europe's foremost fire protection engineer.

About a year later AISI was searching for someone to correlate all of the data from a series of tests that AISI had sponsored at Underwriters' Lab. It was decided that a guide for the design of exposed exterior steel be prepared. Ove Arup was selected and Margaret Law is the primary author.

The problem: The basic problem is that structural steel loses strength rapidly at temperatures higher than 1000F. Such a loss in strength can lead to failure, when a member can no longer carry its design load or suffers excessive deformation. When beam is exposed to fire, the irregularity of its position and shape may cause it to heat unevenly. One side may heat faster than the other, the top before the bottom. The hottest part is expanding faster than the coldest part. It begins to warp and twist. The distortion causes stresses in the beam and in all of the members which frame into it. Sometimes the deformation is working in favor of the load, sometimes against it. These reactions and stress variations are difficult to predict. The goal of fire protection is to prevent the steel from reaching this critical temperature.

Within the building, structural members can be exposed to flames and heat from all directions. Outside the building, the structure has a better chance. The faces of the column or beam are not surrounded by heat, but rather can lose the heat back to the environment.

The solution: The fire must come from the building itself. How hot the fire gets and how long the flames become must depend on the amount of fuel, the amount of air, how quickly the combustible material burns and the characteristics of the compartment where the fire occurs. The first step is to look at the compartment where the fire is likely to take place and the openings which the fire must use to get at the exterior structure. Windows will feed the fire with air. The air tends to be drawn in through the bottom of the window and the

flames shoot out the upper two-thirds of the opening unless the air can feed the fire from another direction or cross-ventilate it. Then the flames can fill the whole opening. The characteristics of the compartment therefore will help determine the type of fire, flame, and heat generated. The worst wind conditions are imposed. The shape, size, and temperature distribution within the flame is calculated. And the heat exchange due to radiation and convection is made to the exposed exterior steel. How much heat does the structure keep and how much does it give back to the rising air or wind? What is the shape of the member? How far is it from the fire? (Answers to these questions will yield a maximum steel temperature. If the temperature has not exceeded 1000F, the structure is acceptable.

If the temperature is too high, the Ove Arup report suggests: 1) moving the steel relative to the windows, the open source of heat and flames. The worst case is the member engulfed by fire. It can no longer lose its heat to its surroundings; 2) shielding or deflecting the member from the flames by use of a fire-resistive device; 3) cutting off the air source by eliminating sources of ventilation to the fire; 4) changing the compartment itself—its dimensions, openings, or occupancy. You can see that we are no longer referring to the fire rating in hours, we are talking about the effect the understanding of these simple principles has on the architecture! Instead of a "cookbook" prescription for fire safety, we can understand the performance characteristics of the building during a fire.

In short, the fire protection engineers who have contributed their time and expertise to FS3 feel they can now accurately predict fire behavior in a building, indicate its probable flame pattern, and predict the temperature of the structural elements affected. Even so, the temperature is conservative and doesn't take into consideration the mass of the column which causes it to lag behind the fire temperature. The original report includes a set of tables which can be used to simplify calculations for preliminary work. For skeptics, all of the theoretical principles are supported by the test results.

This is not a code: FS3 is not a code. Its use, for the moment, is to help in the appeal process for getting a variance in existing codes. Underwriters' Laboratories did most of the testing for the American examples which are mentioned. The first tests at Trenton were run by Underwriters' and served as the basis for the appeal process used in obtaining permission to build One Liberty Plaza in New York. The calculated temperature of the beam at Trenton was 680F. The test showed 640F.

The time temperature curve similar to what is now in use by the codes was conceived in 1906 and adopted in 1917 as a tentative standard. Eleven interested parties and professional organizations gathered to sanctify it. The curve is known as ASTM E119 Time Temperature Curve. Fire testing in this country must demonstrate correspondence to this curve. In recent years, more accurate testing has shown the original curve not to be representative of real fires. Modern fires tend to burn out in a shorter period of time because the structure of the building is incombustible and doesn't contribute to the combustible fuel. Says Siegel "The standard curve is so unlike the real time temperature relationship that it is very difficult to get any type of correlation." Siegel proposed as far back as 1967 that three separate curves be used showing the different characteristics of the small, moderate, and large fire loading. A short, high-intensity fire frequently can reach temperatures above the standard temperature shown on the ASTM curve.

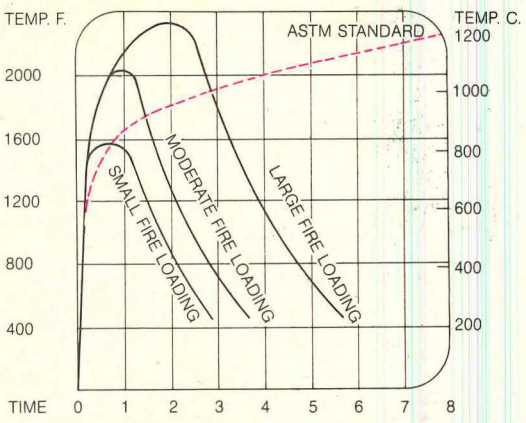
The fire testing organizations are not adversaries in the process. On the contrary, testing officials are faced with the task of testing structural elements under loadings impossible to simulate at small scale. As Larry Siegel says: "People who run tests pray a lot." The National Bureau of Standards is actively working toward the initiation of performance codes in many construction-related fields.

Other countries, however, are ahead of the United States in the field of Performance Fire Codes. The Swedish Institute of Steel Construction publishes a book *Fire Engineering Design of Steel Structures* which lists performance criteria for the fire protection of interior structural members. The techniques of calculation have the same theoretical base as FS3. The code took ten years for adoption. Sweden also has standards very similar to our UL and ASTM regulations. In England the Structural Steel and Research Organization has published a design guide for liquid filled systems. In France, Jacques Brozzetti has written *Principles and Basis of the Verification by Calculation of the Fire Behavior of Steel Structures,* a work of the Centre Technique Industriel de la Construction Metallique.

The Swedish Code and FS3 together would make a performance fire protection code of the technological level that we have achieved in the rest of the construction industry. Perhaps Margaret Law could do the work. Larry Siegel affirms "Fires are international, they burn the same all over. Why should you have any different codes. You can have different requirements, but the design methods should be the same."

A new kind of professional: Margaret Law is Senior Fire Engineer with Ove Arup & Partners. Prior to her present job, she was Principal Scientific Officer in the Building and Construction Division of the Department of the Environment in London. Her initial experience was with the Fire Research Station in England.

Fire protection experts are not common. A peculiar need for a combination of construction and engineering knowledge limits the number of qualified practitioners. Prior to 1965, fire protection engineers dealt mainly with insurance companies. As the recent interest in performance understanding and calculation has increased,

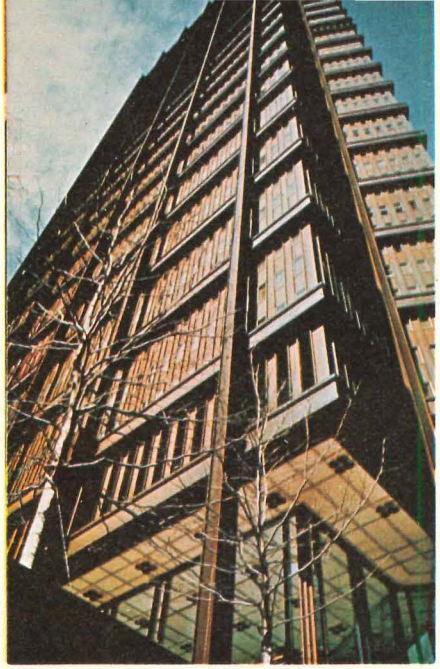


Time temperature curves developed by US Steel's Larry Siegal, based on fire loading (above). In the Bush Lane House (below) by Ove Arup in London, liquid-filled steel tubes make up the elegant latticelike exterior filigree.

the job has changed. Industry is tired of having its product's use restricted irrationally. Society in general is calling for more accuracy, dependability, and safety from buildings. A dozen or so fire protection engineering firms in this country have undergone a rapid rate of growth. Rolf Jensen is a good example. Jensen began his consulting firm in Chicago while teaching fire protection engineering at IIT. In 1969, the firm consisted of three people. Today, he has offices near Washington, San Francisco, and Toronto, as well as Chicago, and employs over 20 professionals. The Jensen office is typical of the innovative sources in this article. It is made up of fire protection engineers as well as mechanical, electrical, and architectural professionals.

Interest in fire protection is growing in the schools. IIT's Bachelor of Science and Fire Protection is the oldest in the country. The University of Maryland also offers a bachelor's degree in the subject. Worcester Polytechnic and the University of California at Berkeley both offer strong fire protection options.

Bethlehem

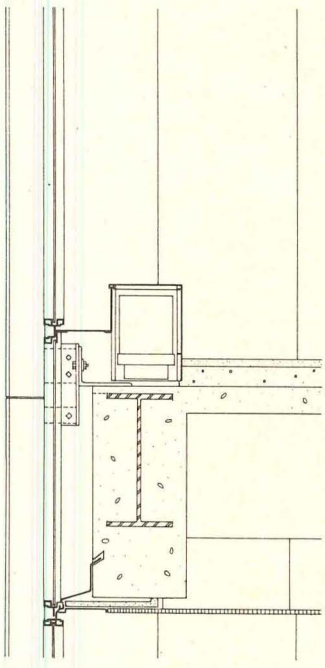


US Steel

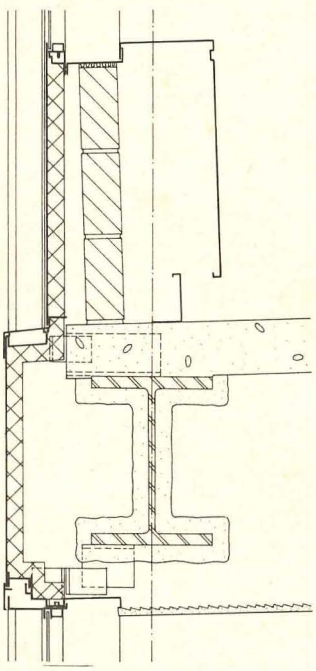
Harry Weese & Associates

US Steel

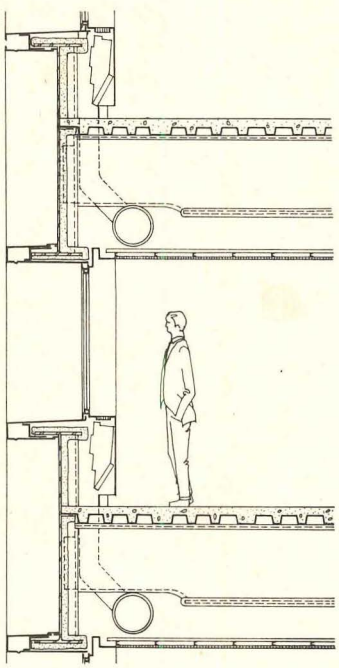
Even in steel mills (top, left) steels must be able to withstand withering temperatures. Tests such as the Newark test (left) for US Steel by Underwriters Laboratory measure the actual fire temperatures reached by exterior steel surfaces. The US Steel Building in Pittsburgh stands on liquid-filled columns (top, center), with other exterior steel flame shielded. Designed in the late 1960s by Harrison & Abramovitz & Abbe, it was a dramatic chance for the steel giant to demonstrate fire protection expertise. On the Mercantile Bank Tower, Kansas City (above, and below, right), Harry Weese & Associates used a method of flame shielding. The other sections below show various prominent examples of fire protection. They are the Seagram Building, in New York, Mies van der Rohe and Philip Johnson; The John Hancock Building in Chicago, SOM; and One Liberty Plaza in New York, also SOM.



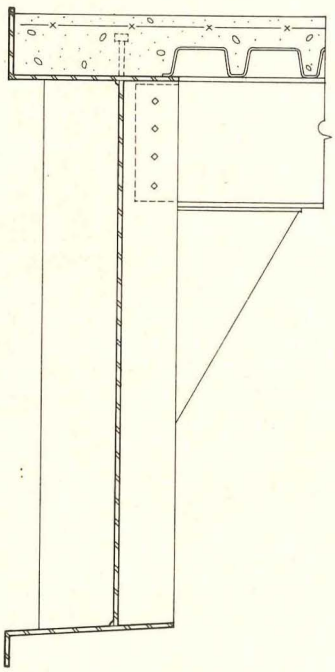
SEAGRAM



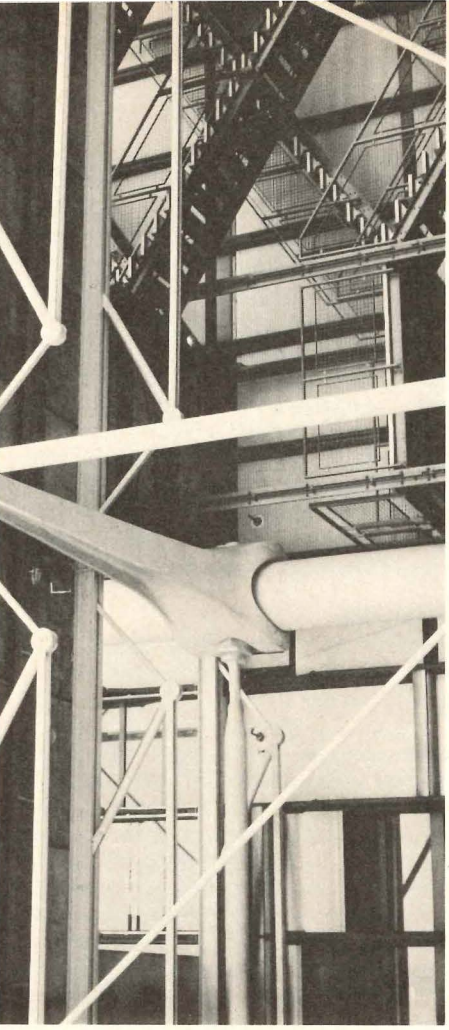
HANCOCK



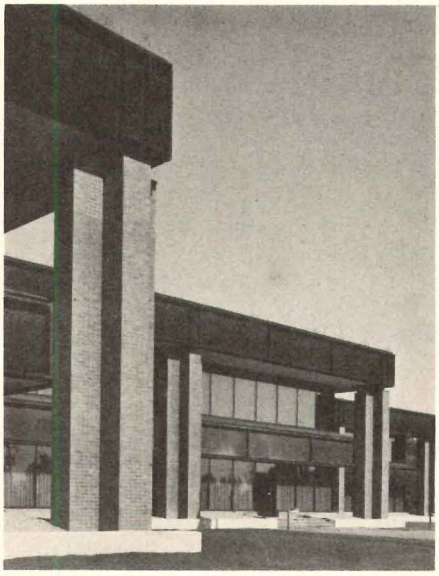
ONE LIBERTY PLAZA



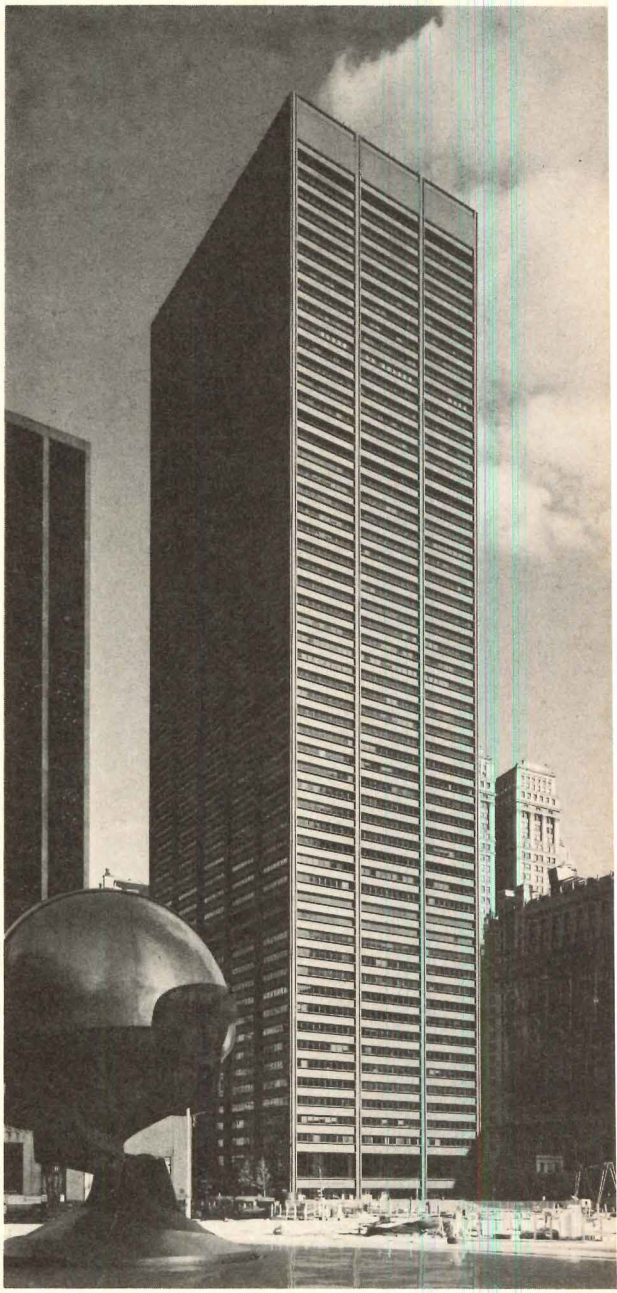
MERCANTILE BANK

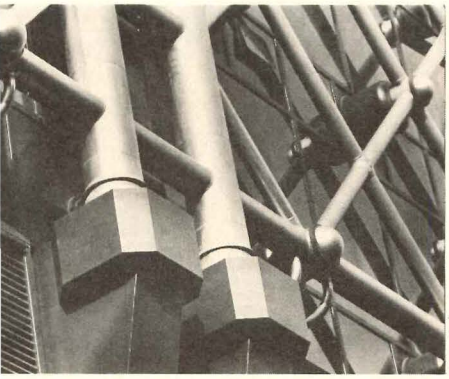


Ove Arup & Partners



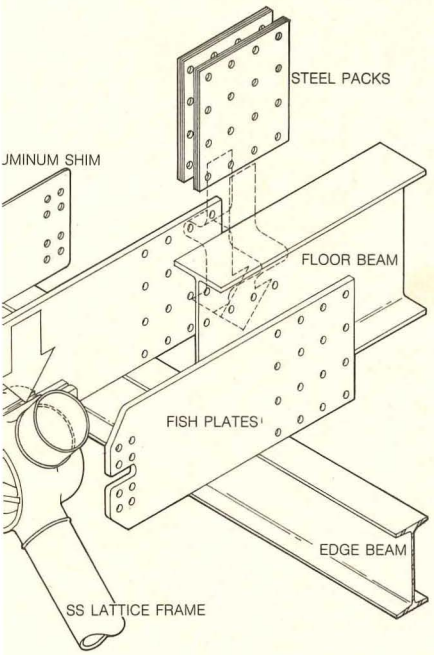
A.M. Kinney Associates



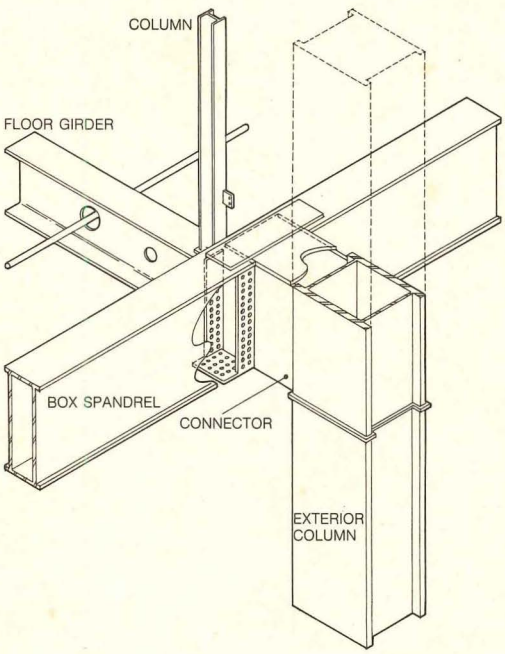


Ove Arup & Partners

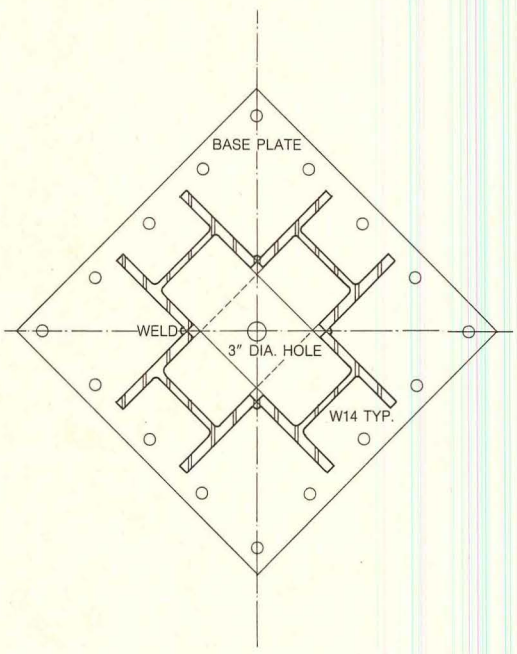
Exterior expression can use fire protection in an obvious way or not. For Centre Pompidou in Paris (top, left) and London's Bush Lane House, Ove Arup, and Piano & Rogers have made strong statements that are at once beautiful and quite functional. Exterior tubes (left column) carry liquid, and are integrated into the design. At Bush Lane, manifolds (left, center) collect the liquid from typical nodes (left, bottom). The US Steel Building (below) and The Mercantile Bank (right, below) have liquid-filled columns, the latter at the base only. In both of these examples, the expression is much more subtle if compared with the European buildings. Even more subtle is One Liberty Plaza (right). Exterior surfaces of steel elements are flame shielded. Therefore, the unprotected steel is the only thing seen, as is the case with the offices for Moore Business Forms, by A.M. Kinney Associates.



: HOUSE



U.S. STEEL



MERCANTILE BANK

Cables on the air

David Geiger, is the reigning engineering expert on the subject of low profile air supported cable roof structures. "The only structural system" says Geiger, "which you can, with certainty, say will be evolving into the future is tensile structure systems. Compressive structures are limited by geometry, not materials." It is the future developments in the increased tensile capacity of steel which will lead it into the next century.

The structural concept is wonderfully simple. Air is pumped into the building to support the fabric roof at a pressure of about 5 psf. The profile of the building must be kept low, out of the way of the wind. Therefore, rather than simply clamping the fabric just at its edges, flexible steel cables are used across the span. In addition to holding the low profile, steel cables permit the roof to be constructed in pieces. The fabric spans the short distance between the cables, the strength of steel spans the long distances. If the ends must terminate in the supporting structure and then be carried to the ground, we face some choices. If the tensile force in the cables is transmitted to a beam, that beam will carry large moments. Bending is a very inefficient way to carry load. If an arched shape is used, more of the load can be carried in compression and the stresses are more uniform and efficient. The ideal support system for an air-supported roof structure is a funicular ring which is curved and greets the cables with a closed curvilinear member. The tensile forces from the cables of the low profile structure produce forces at the cable ends which require a funicular ring regardless of whether the roof rests directly on the ground or is held in the air. A radial cable arrangement would suggest itself. Experience has shown this not to be the ideal cable arrangement. A circle, for example, with the cables arranged like the spokes of a wheel will result in an inflated roof which has a dimple at the center. Two cable arrangements will work. The first is orthogonal like the strings in a tennis racket. The second is "skewed symmetry," a criss-crossed geometrical solution which has been invented and patented by David Geiger.

In a stadium, the worst seats are at the ends. The structure is usually oblong, the field is rectangular. If the corners of the rectangle are lopped off at an angle, or curved, cables can span from corner to corner and take advantage of "arch" action, rather than the beam action which results spanning from side to side. Now arrange the criss-crossing cables to take advantage of fabric translucency, tensile strength, and symmetry for duplication in fabrication.

The hard part is determining the assymetrical loading of wind uplift and weather. Construction and erection puts loads on the structure which are very difficult to predict. Uninflated and inflated the structure is a peach to calculate, in between those states it is a rat's nest. The maximum loading in the cables occurs when the structure is fully inflated or deflated. Maximum distortion occurs in the joints of the roof in between these two states. The structure is designed, however, so that the fabric will always fail first, not the cables. Even in failure there is economy. The roof is composed of clamped pieces of fabric, permitting pieces to be repaired cheaply and quickly. Should the roof accidently deflate, it simply hangs limp in the space.

Of course, architects who deal with this new structural possibility need not be involved with the complexities of the structural design. The final shape of the roof is mathematically determined with computer aids and solutions can be examined at will. We need only look at the best ones.

In the mid-1960s, AISI commissioned David Geiger to study the economics of long span cable roofs, domes, and space trusses. His research stimulated interest in air-supported cable reinforced structures. The Osaka World's Fair allowed him to seize an opportunity for innovation. At that time, the only fabric available for inflated structures was a vinyl-coated polyester. It is still used today for temporary structures.

After Osaka, Educational Facilities Laboratories provided funds and a team of experts gathered to attack the problem. DuPont had the Teflon, Owens-Corning, the fiberglass, Chemical Fabrics wove it together, and Birdair fabricated the pieces. The result lasts 20 to 30 years and, when clamped to the steel cables and suspended on air, makes a perfectly wonderful translucent ceiling.

Cable details: An interesting detailing feature is condensation. In the details shown on the following pages gutters are part of the clamping device that attaches the fabric sections to the cables. A cursory understanding of condensation would lead us to expect water droplets on the interior surface on a cold day. Surprise! With the teflon surface the droplets are minuscule! As obvious as it may sound, it appears that water will not condense on a surface it can not easily "wet." To go from a vapor state to a liquid state, water vapor must latch onto a material sticky enough to cool it down (a process called nucleation). Most recent clamps, then, use no gutters.

Low profile air-supported cable structures have their limitations. The added responsibility of maintenance and operational costs as well as material costs make it only desirable at long spans (and very long spans.) For the proper span the added features of translucency and energy savings on lighting, coupled with a savings on air conditioning combine to make an attractive operations cost. When the clients investigated the cost effectiveness of the air supported roof, they discovered they couldn't afford not to build it.

Geiger and partners Horst Berger and mechanical engineer Karl Beitin have constructed five low profile air-supported cable structures. Three more are under construction. Their designs include more than 30 conventional fabric tensile structures. Their most recent innovations have been in Florida. A 247,000-sq-ft structure at the University of Florida at Gainesville is designed by Caudill Rowlett Scott. It has an air-supported central dome and is flanked by a tensile structure skirt. The Florida Junior College in Jacksonville studied an air-supported cable structure which is doubled and allows the cell between the layers to act as a solar collector.

In outer space, steel crystals miles long might become a reality. David Geiger has visions of spanning thousands of feet with a fabric light enough to form a roof which can be supported by the heat which naturally generates from uses beneath it.

Conclusion

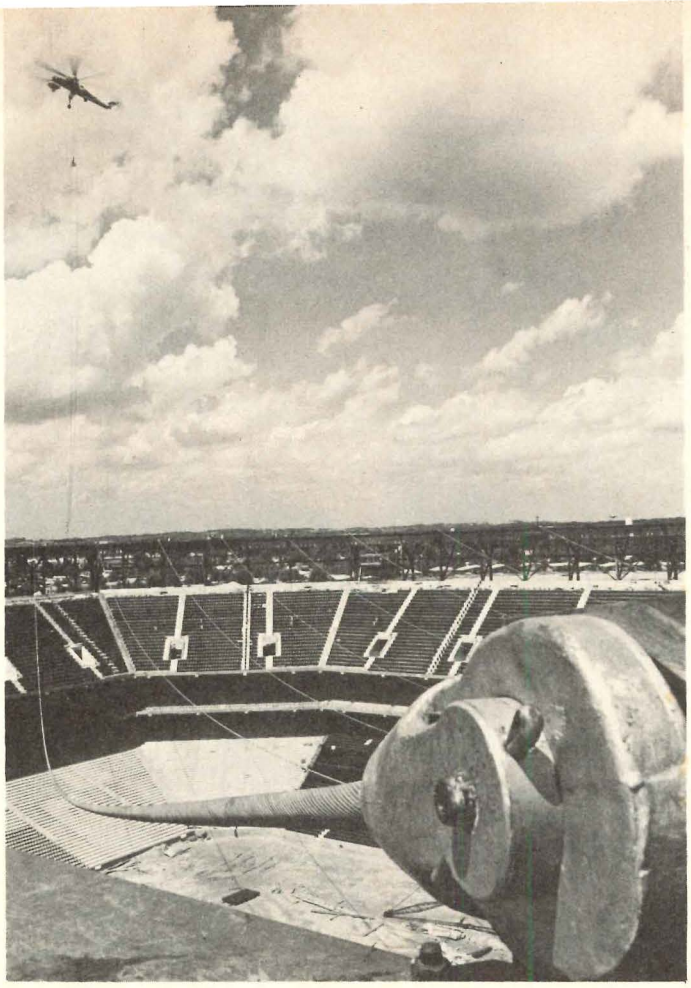
We have tried to concentrate on the engineering and research innovations in steel construction, rather than the specific architectural examples which use them. These new creative inventions serve as the soil where imaginations can take root.

It is clear that our role as architects is changing. We have always been dependent on other disciplines to execute our buildings. Now, due to the scale of the task, we must depend on other professionals to help us build our thoughts as well.

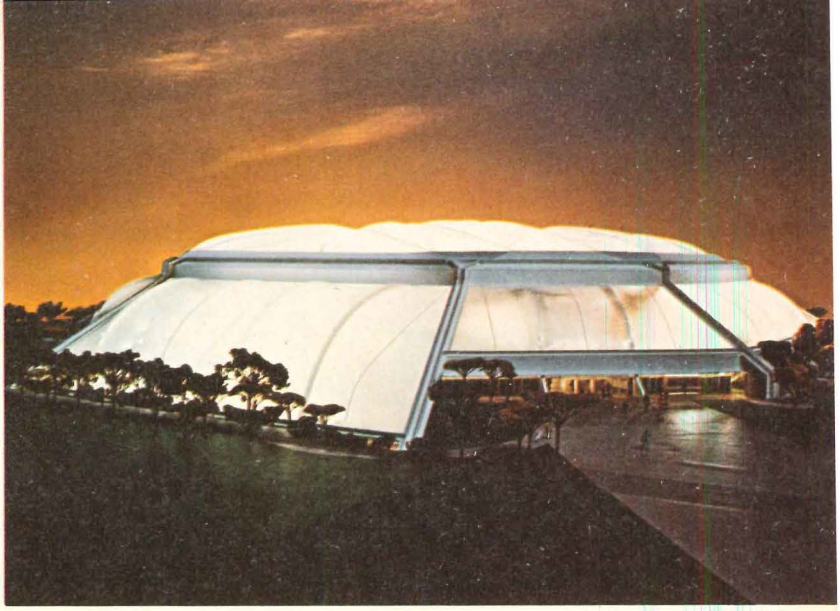
Steel is a precious fabric which passes from generation to generation of modern architecture. We admire it, love its talent to soar and its crisp clean rigor. Yet we cannot resist another tug at the fit, and a tuck of our own. [Richard Rush]

Acknowledgments

We wish to thank the following architects, engineers, institutions, and manufacturers for their help in preparing this article: AISC, Robert Disque; American Iron & Steel Institute; Armco Steel; Ove Arup & Partners, Margaret Law; Welton Becket Associates, Richard G. Troy; Dr. Lynn Beedle; Bethlehem Steel; Birdair Structures; Butler Manufacturing; Caudill Rowlett Scott; Colaco Engineers Inc., Joseph Colaco; Cyclops, Elwin G. Smith; Henry Degenkolb & Associates, Loring A. Wyllie; DuPont; Dr. Steve Fenves; Geiger Berger Associates, David Geiger; Dr. Kurt H. Gerstle; Granco; Helios Tension Products; Inryco; Rolf Jensen; Johnson/Burgee, Architects; A.M. Kinney Associates; Dr. Le-Wu Lu; Mulach Steel; National Bureau of Standards; Nucor Corporation, Vulcraft Division; Dr. Irving Oppenheim; Owens-Corning Fiberglas; Power-Strut; Dr. Ralph M. Richard; Dr. Geoffrey K. Sigworth; SOM Chicago, Dr. Fazler Kahn; SOM, New York office; Steel Joist Institute; Underwriter's Laboratories; UNISTRUT; US Steel; Harry Weese & Associates; Weidlinger Associates, John M. McCormick, Professor Mario Salvadori; Wheeling-Pittsburgh Steel.

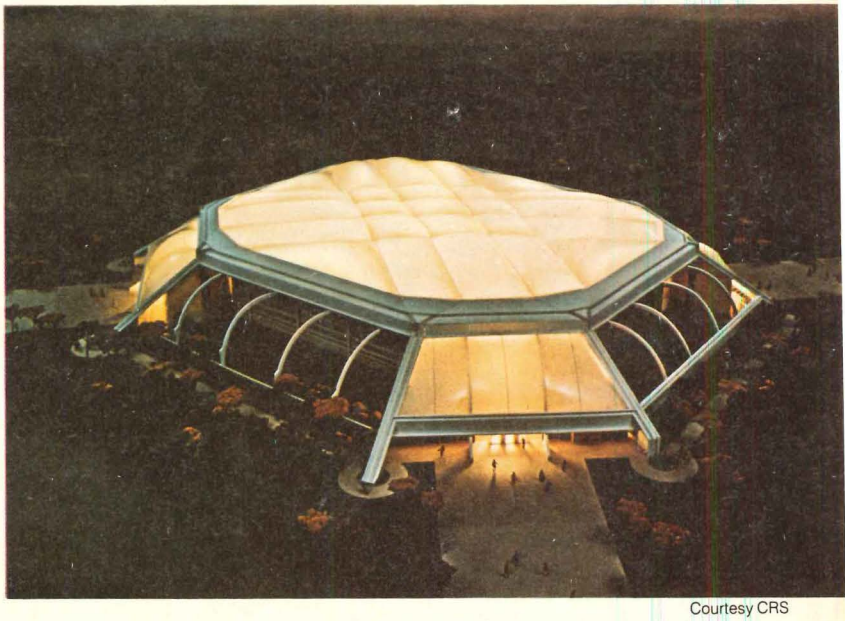


Pontiac, Michigan Stadium cables being placed by helicopter.



Courtesy CRS

Caudill Rowlett Scott, with Geiger-Berger, has designed facilities for The University of Florida in Gainesville (above) and The University of South Florida (below). Both are air-supported, but the Gainesville job incorporates Teflon/fiberglass tensile structures on the perimeter.



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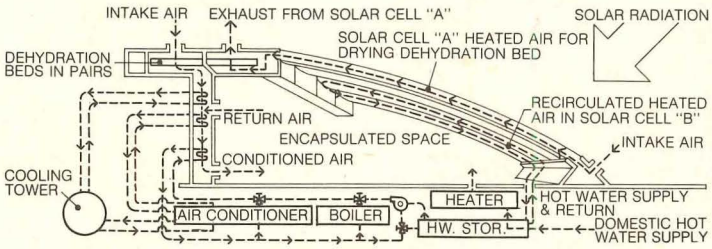
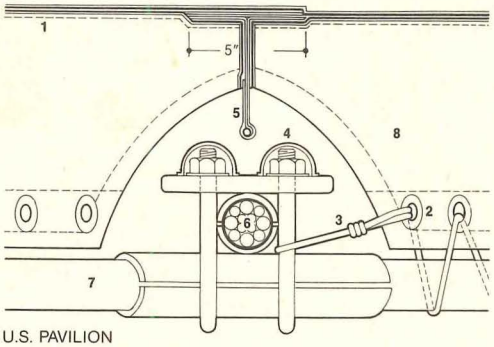


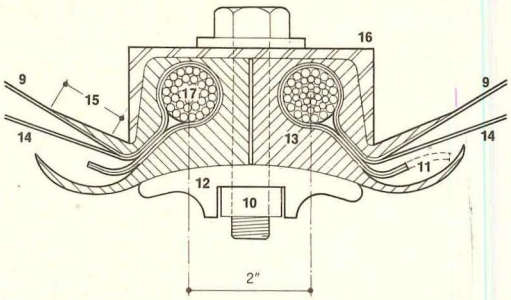
Reynolds, Smith & Hills/Geiger Berger; schematic of solar application.

Legend

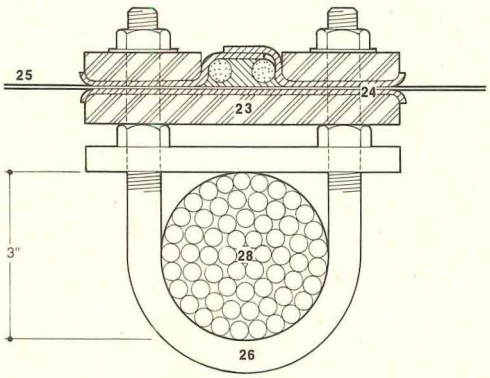
1 Roof fabric, cordoglass
2 Spur grommet
3 Nylon rope
4 PYC cap
5 Upper lacing skirt
6 Upper cable
7 Lower cable
8 Lower lacing skirt
9 Outer skin
10 Squire nut
11 Trim in field
12 Extruded alum. plate
13 Neoprene extrusion
14 Inner skin
15 Glue this portion
16 Aluminum channel
17 1⅛″ ϕ cable
18 Roped edge fabric
19 ½″ ϕ armored cable
20 1⅝″ ϕ cable
21 Adjustable pipe hanger
22 Top cable polyethylene gutter
23 Aluminum plate
24 Neoprene strip cont.
25 Roof fabric
26 ½″ u-bolt
27 ½″ nylon rope edge
28 Zinc coated bridge strand



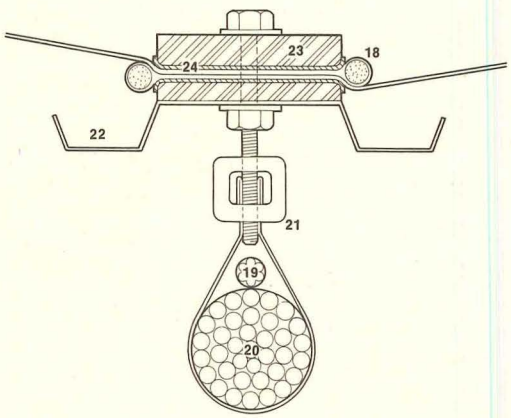
U.S. PAVILION



MILIGAN COLLEGE



UNIVERSITY OF NORTHERN IOWA AND PONTIAC STADIUM



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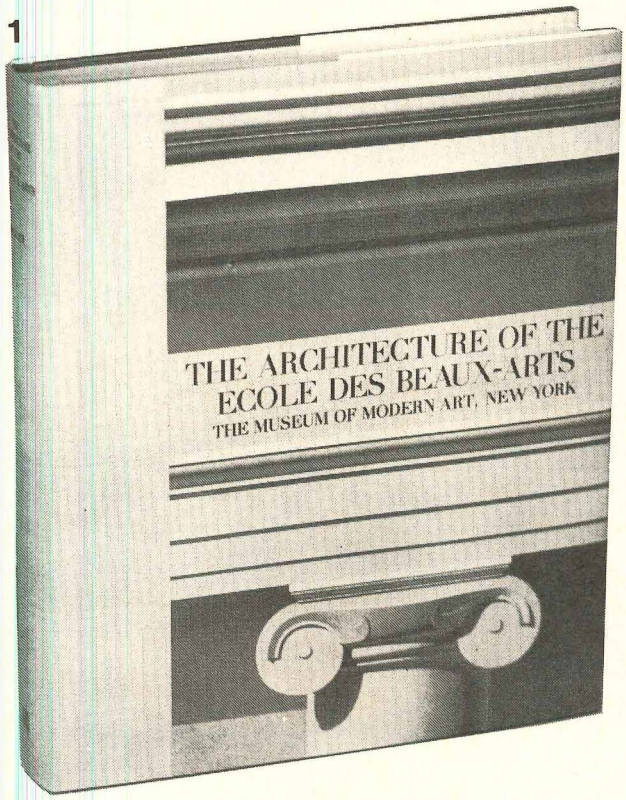

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By William W. Atkin,
196 pp., illus., . . . $15.95

This book includes presentations ranging from simple sketches in pencil and pen-and-ink to elaborate drawings, photographs, slide presentations and various combinations of media achieved with overlays, camera techniques and modern reproduction methods.
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4 The Autonomous House

By Brenda and Robert Vale,
224 pp., illus., . . . $10.00

Two architects offer practical solutions to the design of a house that operates independently within its environment. This "Autonomous House" is not linked to utility lines for gas, electricity, water, or drainage; but instead uses the energy of sun, wind and rain to service itself and process its waste.
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5 Architectural Rendering: The Techniques of Contemporary Presentation

By Albert O. Halse, 326 pp.,
illus., 2nd edition, 1972 . . . $29.00

This completely up-dated revision of the most widely used guide to architectural rendering covers all working phases from pencil strokes to finished product — and shows how to obtain the desired mood, perspective, light and color effects, select proper equipment and work in different media.
Circle B605 under Books.

NEW★

6 A Graphic Guide to Industrialized Building Elements

By Raymond Sluzas & Anne Ryan
176 pp., illus. . . . $17.95

This ideal source book and general reference tool describes and analyzes the characteristics and practical applications of those parts of a building which are preassembled as a unit in the factory. In a clear, encyclopedic style, it provides a substantive overview of the options and resources available.
Circle B606 under Books.

7 After Mies

By Werner Blaser,
291 pp., illus., . . . $19.95

One of the most prominent architects of the 20th Century, Ludwig Mies van der Rohe was head of the Dept. of Architecture of the Illinois Institute of Technology (IIT) in Chicago from 1938 to 1959. This book exemplifies his principles and teaching during that period.
Circle B607 under Books.

NEW★

8 History of Modern Architec Volume 1: The Tradition of Modern Architecture Volume 2: The Modern Movement

By Leonardo Benevolo
912 pp., illus. . . . $20.00 the s

This 2-volume paperback box lavishly illustrated, is the first translation of a notable history ern architecture by one of Italy most teacher-architects. Vol covers the period 1760-1914, 2 from 1914-1966.'
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9 Graphic Standards of Solar Energy

By Spruille Braden,
224 pp., illus., $19.95

A timely design reference gu those involved in the structurin environment. The author energy-conscious design wi chanical systems for commer stitutional and residential bu providing quick and efficient e lation of data from design co working drawings.
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10 Apartments, Townhous and Condominiums

Edited by Elisabeth Kendall Thompson
228 pp., illus., . . . $21.95

This heavily illustrated volum into consideration a number criteria in its examination of b and high-rise buildings, as townhouses. In-depth cove garden complexes on suburb designing for low and mode come groups, conversions scale developments, apartme condominiums for resort are interiors round out this usefu date volume.
Circle B610 under Books

1 Frank Lloyd Wright's Usonian Houses

John Sergeant,
pp., illus., . . . $24.50

his well-illustrated and thoroughly umented book, the late period of ght's prolific career is reassessed his philosophy of building with re rather than against it is an- ed. Wright's Usonian houses, his esin working communities and his for Broadacre City has a new vance as energy conservation and ogical integrity have become the inant concerns of the environ- tal design professions.
le B611 under Books

NEW★

The New Industrial Landscape – The Story of the Austin Co.

Martin Greif,
pp., illus. . . . $27.50

scinating story of The Austin pany, an innovative company se influence has helped to shape modern world. Traces the com- y's history from its begging in the entry shop of a poor English emi- t to its spectacular growth as a or corporation responsible for olutionizing the international in- rial landscape".
le B612 under Books.

NEW★

Studies in Italian Renaissance Architecture

Wolfgang Lotz,
pp., illus. . . . $14.95

essays, mostly in translation German and Italian originals, sent a selection of the shorter gs of Wolfgang Lotz which illus- most effectively his contribution understanding of Italian Renais- e architecture.
e B613 under Books.

14 Architectural and Interior Models

By Sanford Hohauser,
211 pp., illus., . . . $8.95

This attractive paper-back edition is an essential reference book for the modelmaker, describing more than 10,000 parts, tools, materials and equipment; illustrating more than 800 ready-made model parts; and listing more than 200 suppliers.
Circle B614 under Books.

15 Problem Seeking An Architectural Programming Primer

By William Pena with William Caudill and John Focke,
202 pp., illus., . . . $14.95

Although organized architectural programming has been characterized by a proliferation of methods, this attractive reference book presents five distinctly different methods, each with many variations.
Circle B615 under Books.

16 Site Planning for Cluster Housing

By Richard Untermann & Robert Small
306 pp., illus. . . . $22.50

An invaluable guide to planning low-rise, medium-density cluster housing environments. Also covers jurisdictional and technical considerations of site planning, and includes more than 600 drawings and photos that illustrate design principles and techniques.
Circle B616 under Books.

17 Drawing File for Architects, Illustrators and Designers

By Marc Szabo
251 pp., illus., . . . $12.50

This book provides over 200 pages of figures — in the most common and natural positions, activities, and types of wearing apparel, as well as dozens of drawings of boats and cars, all of which can be copied freely — by direct tracing, photostats, or photocopying machine. The pages tear out easily to form an easily accessible fingertip scrap file.
Circle B617 under Books.

18 Residential Designs

Edited by David E. Link,
192 pp., . . . $14.50

Hi-rise or low cost, condo, multi-family, custom or townhouse, here's a design book that shows you the very best in every class. Complete collection of designs with over 200 illustrations featuring techniques used by some of the nation's leading builders, planners and designers.
Circle B618 under Books.

19 Building Construction Illustrated

By Frank Ching,
320 pp., illus., . . . $17.95

Charmingly hand-lettered by the author, this book presents step-by-step techniques in residential and light construction. Containing over 1,000 drawings, it covers materials, finishes, fastenings, posts, trusses, slabs, wood joists, light steel/aluminum, structural calculations, planning and site work, cost estimating, and construction sequencing.
Circle B619 under Books.

20 Working Drawing Handbook A Guide for Architects & Builders

By Robert C. McHugh,
166 pp., . . . $12.95

This guide is a step-by-step presentation on how to produce working drawings as an integral aspect of communication between designer and builder. Includes convenient check-lists, budgeting information, and data on dimensioning that helps minimize chances of errors.
Circle B620 under Books.

21 Rendering With Pen and Ink

By Robert W. Gill,
368 pp., illus., . . . $7.50

This paper-back edition is a copiously illustrated guide to the techniques and methods of rendering, including sections on perspective, projection, shadow, reflections, and how to draw cars, ships, aircraft, trees, and human figures. The author also describes the very wide range of instruments and equipment currently in use.
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NEW★

22 The Kitchen 100 Solutions to Design Problems

208 pp., illus. . . . $25.00

Whether its style is contemporary, colonial or country, today's kitchen must be designed to function as a convenient, congenial living center. This collection of 100 successful ways to design kitchen spaces explains the particular design problem for each kitchen area and illustrates the solution with superb photographs.
Circle B622 under Books.

NEW★

23 Learning from Las Vegas The Forgotton Symbolism of Architectural Form Revised Edition

by Robert Venturi, Denise Scott Brown and Steven Izenour
244 pp., illus. . . . $17.50

Includes the full texts of Part I of the original, on the Las Vegas Strip, and Part II, "Ugly and Ordinary Architecture, or the Decorated Shed". This book created a storm of controversy in its original edition, calling on architects of be more receptive to the tastes of common people.
Circle B623 under Books.

NEW★

24 A History of World Furniture

By Luis Feduchi,
656 pp., Illus. . . . $50.00

This exquisite slip-cased volume offers a vast panorama of the different styles of furniture throughout history, starting with ancient Egyptian civilization, Greece and Rome, through the Paleo-Christian and Byzantine periods, the Renaissance, Baroque, the Empire period, and finally the Spanish Isabelline style. Includes a brief introduction to contemporary furniture.
Circle B624 under Books.

NEW★

25 Hotel and Restaurant Design

By Douglas Smith,
240 pp., illus. . . . $15.95

A comprehensive guide for owners and operators of small to medium-sized hotels and restaurants that will stimulate ideas on schemes of all sizes, from extending and improving old buildings to planning new developments in town and in the countryside.
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NEW★

26 100 Years of Architecture in Chicago, 3rd Edition Continuity of Structure & Form

By O. W. Grube, P. C. Pran & F. Schulze,
191 pp., illus. . . . $14.95

This lavishly illustrated book explores virtually all the structures that have established Chicago as the single most important metropolis in the history of modern architecture, with particular emphasis on the direction taken over the past 100 years.
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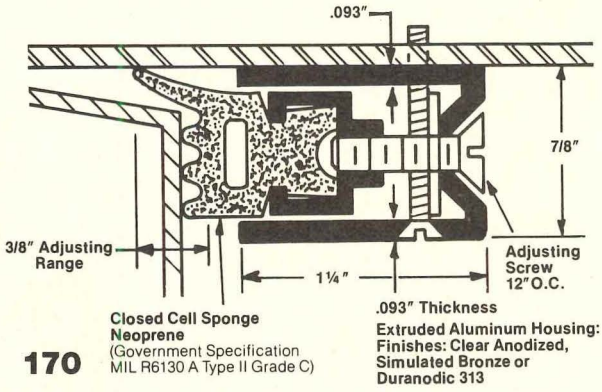

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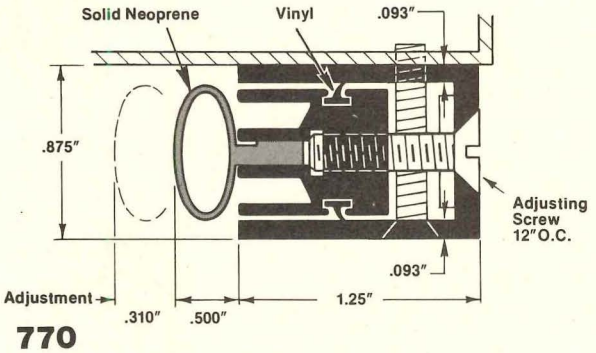

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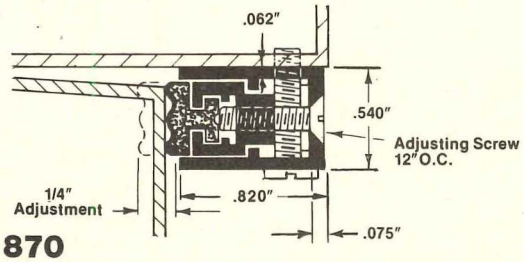

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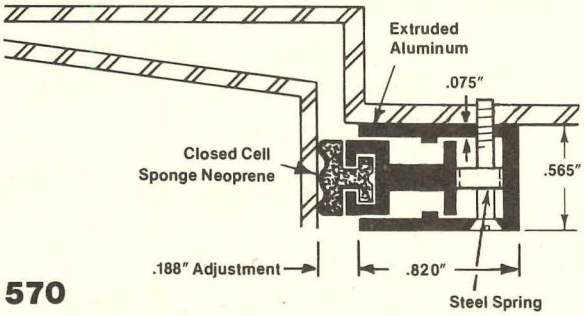

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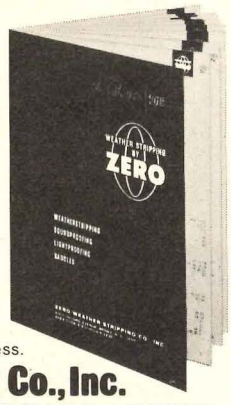

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Stemming architects' expanding liability—part I

Bernard Tomson and Norman Coplan

The potential liability of architects appears to continuously expand as a result of judicial decisions on this subject. Of particular concern are decisions extending the time within which architects may be sued.

One possible approach to hold back the trend of an architect's expanding liability would be to further revise the AIA Form Architect-Owner Agreement incorporating therein specific time limitations within which a claim could be asserted against an architect. The case to be discussed here illustrates the type of decision which would seem to call for serious consideration of such an approach.

When a claim is asserted against an architect by an owner, arising out of alleged errors or omissions, the time within which legal action must be instituted under the appropriate statute of limitations may depend upon whether the claim is considered by the court to be essentially a negligence claim or whether it is deemed to be one premised upon breach of contract. In many jurisdictions, the courts have construed claims by an owner against an architect based upon the alleged failure of the architect to exercise due care as essentially negligence claims, even if the complaint is worded in terms of breach of contract, and thus have applied a shorter statute of limitations. We have, however, previously reported (see "It's The Law," P/A, Oct. 1976) that despite long-standing precedent to the contrary, the New York Court of Appeals ruled that the longer statute of limitations applicable to contract actions would be applied in an arbitration proceeding between owner and architect on the premise that the right to arbitrate stems from a contractual relationship between the parties. We indicated at that time our concern that the rationale of the Court might be extended to litigation between owner and architect outside of arbitration. This concern was justified by a decision in December 1977 by the New York Court of Appeals in the case of *Sears, Roebuck and Co.* vs *Enco Associates, Inc.* This case in effect repudiated all precedent on this subject and held that inasmuch as the architect/owner relationship had its genesis in a contract, the owner could commence legal action arising out of errors and omissions of the architect within six years after the project was completed.

The *Sears, Roebuck* case involved the design by an architect and the supervision of construction of a system of ramps for a parking deck to be constructed over a department store. The project was completed in 1968. In 1970, cracks appeared in the ramps that endangered the structural integrity of the ramp system. It was contended that the cracks were due to improper design of the snow melting pipes contained in the ramps, and the owner instituted a legal action in 1972 alleging, among other things, that the lack of professional care on the part of the architect constituted a breach of contract. A motion was made to dismiss this cause of action on the ground that the action was barred by the applicable three-year statute of limitations. This motion was granted, and upon appeal, the dismissal was affirmed. On further appeal to the highest court of New York, the dismissal was reversed. The Court said:

"All obligations of the architects here, whether verbalized as in tort for professional malpractice or as in contract for nonperformance of particular provisions of the contract, arose out of the contractual relationship of the parties—i.e., absent the contract between them, no services would have been performed and thus there would have been no claims. It should make no difference then how the asserted liability is classified or described, or whether it is said that, although not expressed, an agreement to exercise due care in the performance of the agreed services is to be implied; it suffices that all liability alleged in this complaint had its genesis in the contractual relationship of the parties."

In reaching the conclusion that the statute of limitations applicable to contract actions would apply rather than the shorter statute applicable to negligence, the Court had to deal with the legal authorities which held to the contrary and with the express provision contained in the statutory law of New York that malpractice actions were to be governed by the three-year negligence statute of limitations. In these respects, the Court said:

". . . the choice of applicable statute of limitations is properly related to the remedy rather than to the theory of liability. . . . We (take) note, however, of the cases in our courts in which the choice of statute of limitations had turned on what was termed the 'reality' or the 'essence' of the particular theory of liability on which the plaintiff relied. . . . 'many of these cases were decided in the context of causes of action to recover damages for direct or underlying personal injury,' and . . . different policy considerations were involved . . . personal injury action—and the cases in its wake should not be blanketed to cover all cases. . . . Without intending to disturb the holdings in the line of cases that deal with claims for personal injuries for malpractice on the part of members of one of the professions and acknowledging the Legislature's general address to malpractice claims . . . we (hold) that claims by owners against architects arising out of the performance or nonperformance of obligations under contracts between them are governed by the six-year contract statute of limitations."

In next month's column, we will discuss the feasibility of incorporating a provision in the Owner-Architect Agreement to limit the time within which legal proceedings may be institute against an architect. □

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Barrier-free bibliography

A Survey of State Laws to Remove Barriers, *published by The President's Committee on Employment of the Handicapped. 111 20th St., NW, Washington, DC 20210. Free.*

Access to America: A Compendium of Federal and State Legislation Pertaining to the Removal of Environmental Barriers Affecting Persons with Mobility Limitations. *Michigan Center for a Barrier Free Environment, 6522 Brush St., Detroit, Mi 48202. $15.*

Access to the Environment: A Series of Reference Documents on the Design and Development of Site Facilities to Make Them Barrier Free to the Physically Handicapped and Disabled. *3 Volumes. Office of Policy Development and Research, Dept. of Housing and Urban Development, Washington, DC. Free.*

Architectural Barriers: Bibliography, *prepared by Library of Congress, Reference Section, Division for the Blind and Physically Handicapped, Washington, DC 20542. Free.*

Architectural Planning for the Physically Handicapped, *prepared by The National Easter Seal Society for Crippled Children and Adults. 2023 W. Ogden Ave., Chicago, Il 60612. Free.*

Barrier-Free Design: A Select Bibliography, *prepared by Peter L. Lassen, Paralyzed Veterans of America, 30408 Ford Rd., Garden City, Mi 48135. $6.*

Barrier Free Design: Report of a United Nations Expert Meeting on Architectural Barriers and Disabled People. *Rehabilitation International, 122 E. 23 St., New York, NY 10022. $5.*

[continued on page 124]

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But the most important connections of all are the ones to be made by conferees during the week in Aspen and in their professional lives thereafter.

Ralph Caplan

Andrea Baynes

Program Chairpersons

Some of the conference topics:

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How Animals Design Themselves
The Business of Design (and the Design of Business)
Political Connections
Design and the Human Body
Varieties of Partnership

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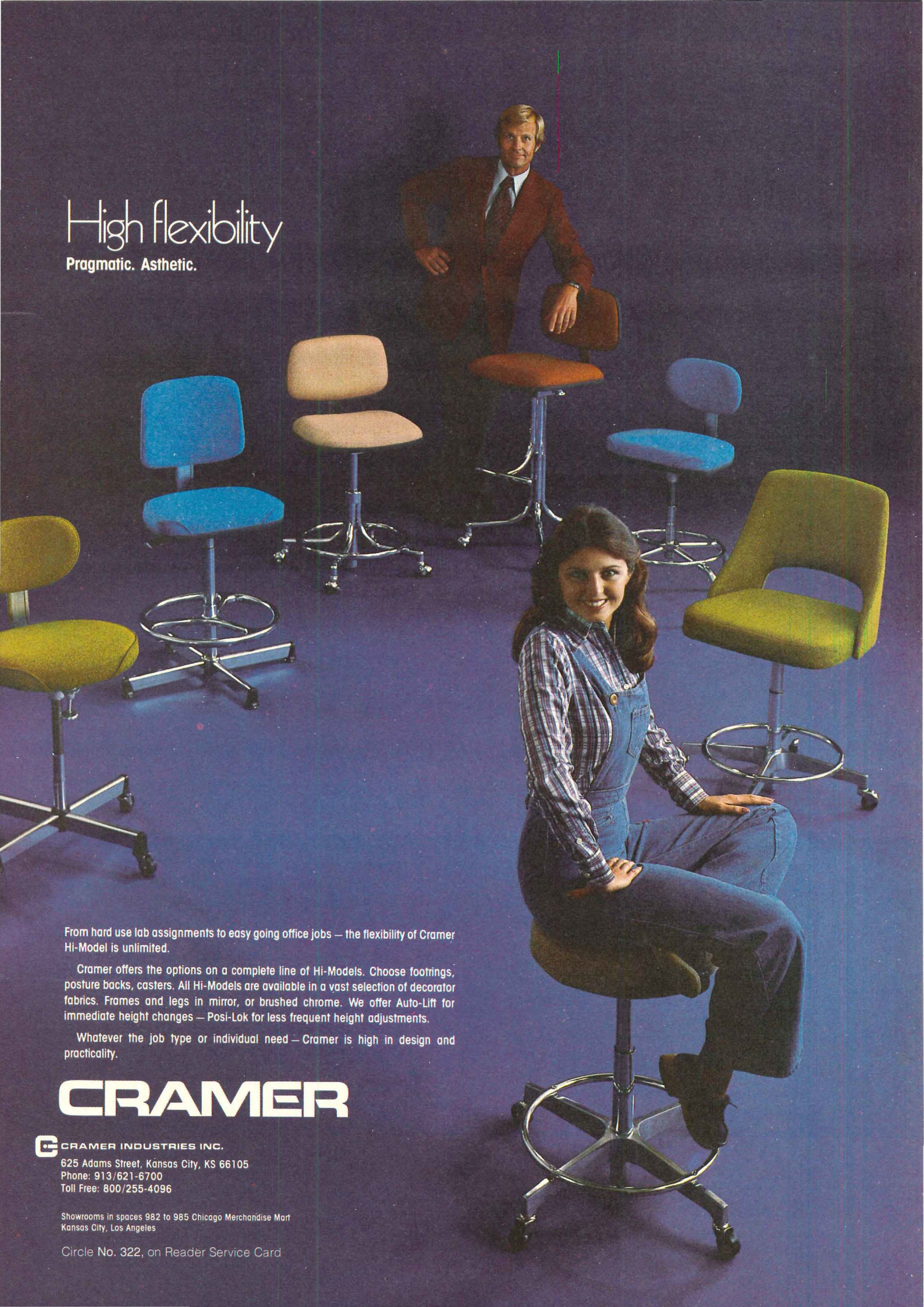

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Books continued from page 120

Barrier Free Environments, *edited by Michael J. Bendar. Dowden, Hutchinson & Ross, Box 699, 523 Sarah St., Stroudsburg, Pa 18360. $22.50.*

Barrier Free Site Design, *research conducted by American Society of Landscape Architects Foundation. Office of Policy Development and Research, Dept. of Housing and Urban Development. Superintendent of Public Documents, Government Printing Office, Washington, DC 20402. $2.30.*

Building Without Barriers for the Disabled, *by Sarah P. Harkness and James N. Groom, Jr. Whitney Library of Design, 1515 Broadway, New York, NY 10036. $10.50.*

Design Criteria: New Public Buildings Accessibility, *prepared by the Office of Construction Management, General Services Administration. Business Service Center, GSA, John W. McCormick Post Office and Court House, Boston, Ma 02109. $2.60.*

Design for All Americans, *report from the National Commission on Architectural Barriers to Rehabilitation of the Handicapped. U.S. Government Printing Office, Washington, DC 20402. 50¢.*

Developing an Accessible Campus for the Handicapped, *prepared by The Association of Physical Plant Administrators of Universities and Colleges and the National Center for Barrier Free Environment. AAPA, 11 Dupont Circle, Suite 250, Washington, DC 20036. $25.*

Housing for the Handicapped and Disabled: A Guide for Local Action, *by Marie McGuier Thompson. National Association of Housing and Redevelopment Officials. 2600 Virginia Ave., NW, Washington, DC 20037. $5, ppd.*

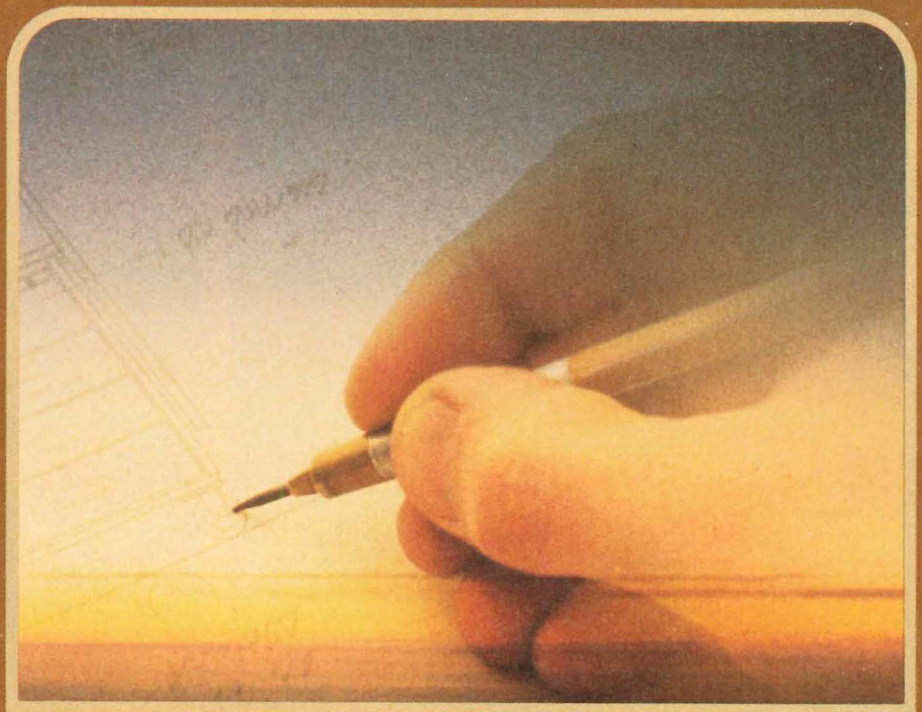
Into the Mainstream: A Syllabus for Barrier-Free Environment, *by Stephen A. Kliment. Publications Fulfillment, The American Institute of Architects, 1735 New York Ave., NW, Washington, DC. $1.50.*

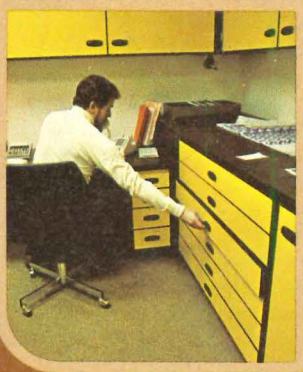
Museum News: Special Issue of Accessibility, *prepared by American Association of Museums, 1055 Thomas Jefferson St., NW Washington, DC 20007. $2.*

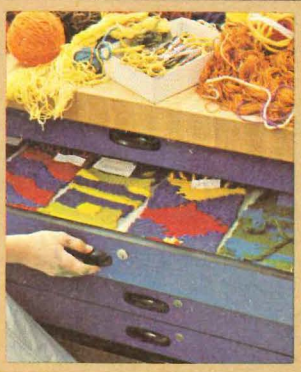
One out of Ten: School Planning for the Handicapped, *report from Educational Facilities Laboratories. EFL, 477 Madison Ave., New York, NY 10022. Free.*

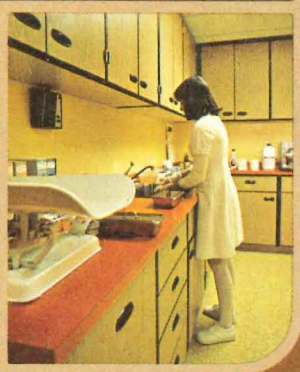
Planning for Accessibility: A Guide to Developing and Implementing Campus Transition Plans, *by Margaret Milner. American Association of Physical Plant Administrators of Universities and Colleges. AAPA, 11 Dupont Circle, Suite 250, Washington, DC 20036. $3.*

Wheelchair Interiors, *by Sharon C. Olson and Diane K. Meredith. National Easter Seal Society, 2023 W. Ogden Ave., Chicago, Il 60612. $1.50.*









Architects should draw their own conclusions.

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Products and literature

Accessories for handicapped

Wall-mounted drinking fountain

Barrier-free design

The items below specifically relate to the barrier-free design articles beginning on page 63 in this issue and they are grouped here for the reader's convenience.

Accessories for handicapped. Hand washing modules are said to provide a barrier-free wash station in one installation. Light, mirror, towel and soap dispensers, lavatory, and waste receptacle are included, with all utilities located 40 in. or less above the finished floor. Other products suitable for the disabled include grab bars and corridor rails. Bradley Corporation.
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Wall-mounted drinking fountain is said to provide easy access to those confined to a wheelchair. Constructed of 18-gauge sanitary stainless steel, Model 440-2 has a skirt that extends a full 20 in. from the wall. Fountain is operated by either one of two dual lever/handles which are attached to all-brass, chrome-plated, self-closing valves. Both handles are actuated by pushing up, down, or inward. Solid brass bubbler is polished chrome-plated, locked to the receptor, and features automatic stream regulation to compensate for fluctuating water pressures. Western Drinking Fountains.
Circle 101 on reader service card

Wheelchair water cooler features dual operating levers, one on each side of the cooler. It is suitable for recessed mounting in a 36-in.-wide alcove. Construction is of heavy gauge steel; standard cabinet finish is chestnut tweed vinyl laminate. Other vinyls, baked enamels, and stainless steel cabinets are also available. Ebco Manufacturing Company.
Circle 102 on reader service card
[continued on page 128]

PENPLY & BRICK

Penply Western Red Cedar exterior 303 plywood siding alone is beautiful, durable and versatile. Combined with brick, Penply's natural beauty is even more dramatic. In fact, using stone, glass or beveled siding as accents with Penply gives your building additional dimension and appeal.

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Wood Products from ITT Rayonier, Inc.

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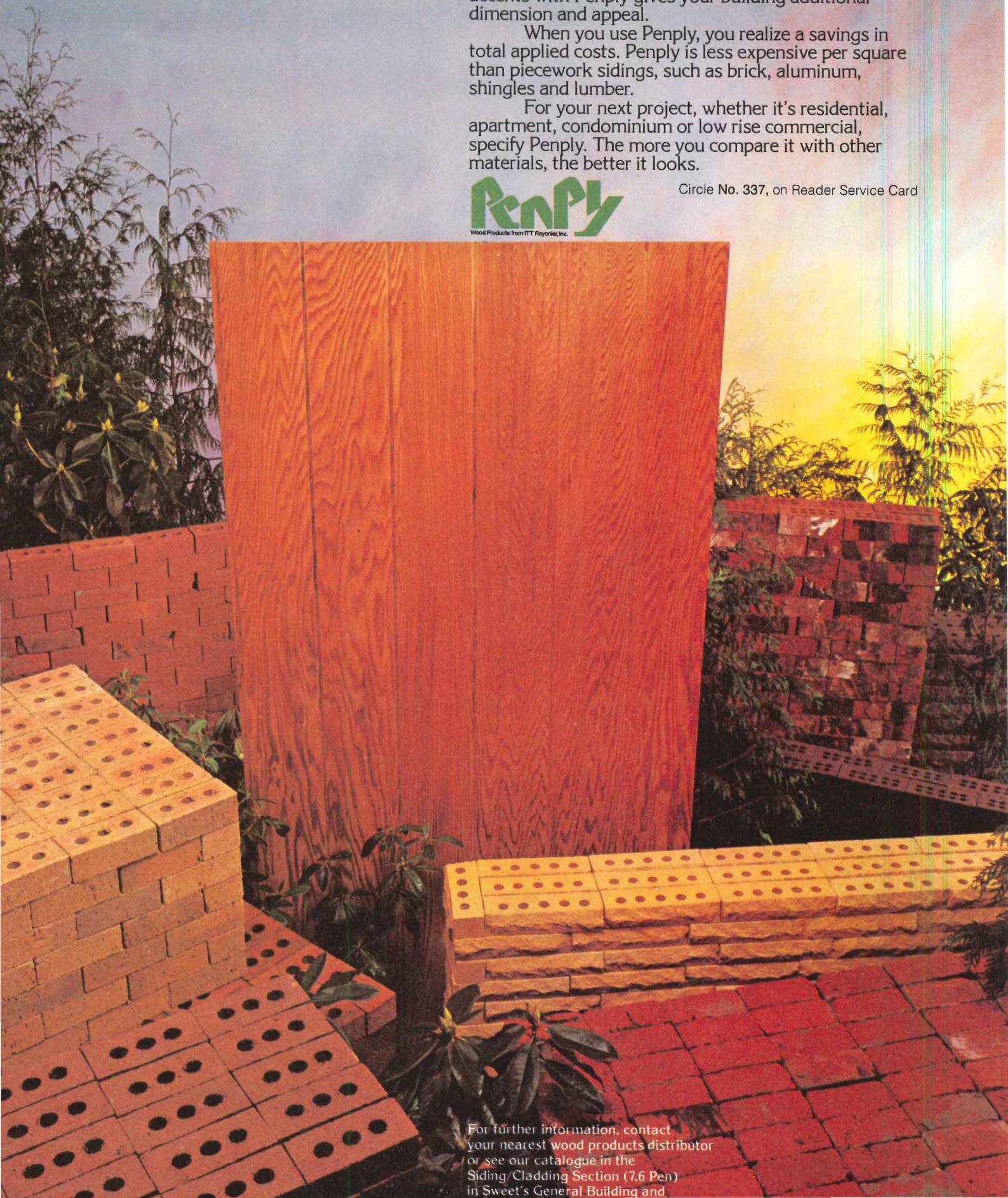
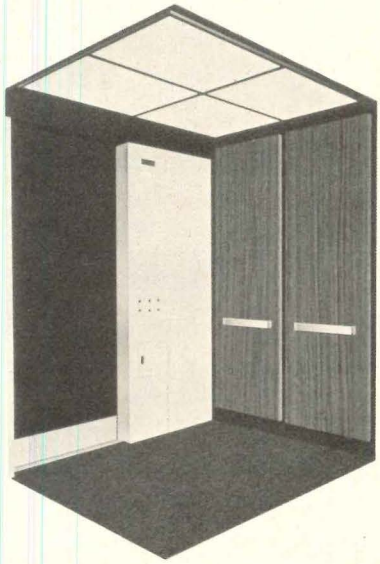


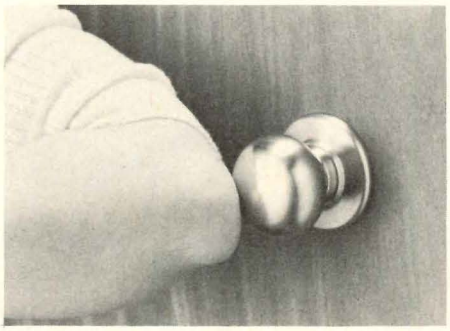
For further information, contact your nearest wood products distributor or see our catalogue in the Siding/Cladding Section (7.6 Pen) in Sweet's General Building and

Products continued from page 126



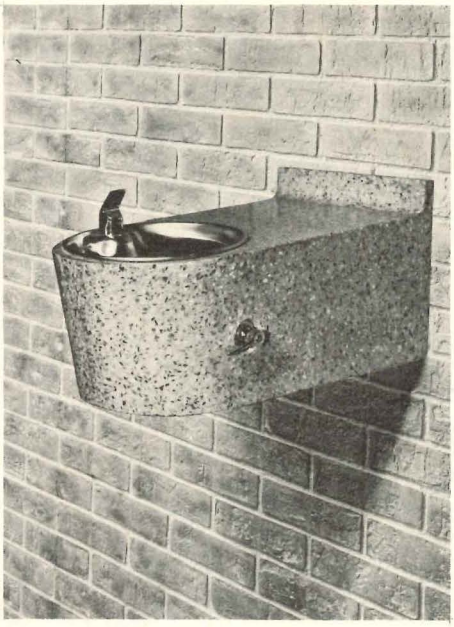
Elevator for the disabled

Elevators for the disabled feature operating buttons at convenient height for wheelchair users, with illuminated position indicator and emergency light above them on panel and emergency telephone below. Audible signals for the blind are standard accessories. Duo-path light beam door control holds door open for entrance and exit, permits prompt closing to minimize delay. Size and layout of cab is said to facilitate use for wheelchairs and stretchers. Models SPF 21-H and SPF 25-H have capacities of 2100 lbs and 2500 lbs, respectively. Both are available at speeds of 200 or 350 ft per minute, serving 3 to 25 landings. Elevators are designed to meet the National Elevator Code. Optional features are available for adaptation to codes of other enforcing agencies. Dover Corporation.
Circle 103 on reader service card



Rollatch door knob

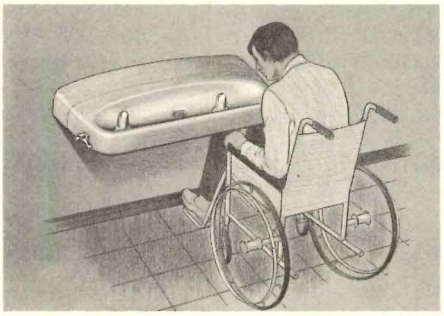
Rollatch door knob. Provides two-way positive latching for easy operation by the disabled, aged, or retarded. It was designed to meet the need for a push/pull operation that also gives positive latch control of the door. The latch operates in conventional manner by turning and by pushing or pulling. It can be operated by fingertip, hand, or elbow. Schlage Lock.
Circle 104 on reader service card



Stone drinking fountain

Stone drinking fountain serves disabled individuals indoors and outdoors. Wall hung unit extends 22 in., providing clearance for wheelchairs. It is available in eight earth-toned colors in polished terrazzo, light aggregate, and exposed aggregate finishes. Stainless steel receptor, lever handle valve, and vandal-proof bubbler are standard. Elkay Manufacturing Co.
Circle 105 on reader service card

Dual bubbler drinking fountain is made of dark bronze hard-anodized aluminum and is said to be suitable for use both outdoors and indoors, and is especially for use by the disabled. The unit extends 17 in. from the wall. Features include vandal-resistant bottom plate, automatic stream regulations, heavy-duty chrome plated bubblers locked to receptor, and nonremovable chrome plated strainer. Haws Drinking Faucet Co.
Circle 106 on reader service card



Dual bubbler drinking fountain

Door operator. The low-power, slow-speed operator allows for both manual and automatic operation. In the automatic mode, when the push button is actuated the door is said to move to a fully open position in approximately three seconds, hold open an additional five seconds, then slowly close by means of a self-contained spring. According to the manufacturer, it was designed primarily to provide low-cost door automation for barrier free entry and exit, but it is suitable for persons with temporary loads such as shopping carts, infant strollers, or heavy baggage. Overhead Door Corporation.
Circle 107 on reader service card

Door operator

Connectorail railing

Connectorail pre-engineered pipe railing includes ramp railings to accommodate the handicapped. An adjustable Tee fitting permits joining posts and rails at any ramp angle from 0 to 28 degrees. The fitting is fabricated from extruded metal and features flush, concealed connections. Bulletin 881-E describes aluminum and stainless steel component parts together with giving engineering data and installation instruction. Julius Blum & Co., Inc.
Circle 108 on reader service card

Low-velocity air entrance. One of its benefits is said to be that it is safer than manual or automatic power-door entrances for both adults and children, while accommodating twice the traffic volume. Company's field engineers will technically demonstrate in your office a working scale model of the system. The building model simulates conditions to be found in commercial and public buildings—with and without the AirPAC system—under varying wind conditions. It also demonstrates how drafts, conditioned air loss, and undesirable air turbulences are eliminated, how uniform temperatures can be maintained. The AirPAC's components provide a completely pre-wired pre-plumbed packaged unit. Air Door, Incorporated.
Circle 109 on reader service card

Low-velocity air entrance

Touch-Open rubber doors. Designed to be used by the physically handicapped without assistance, the doors are said to open with minimal effort and to be self-closing automatically after passage. They have flexible unitized construction 1 13/16-in. thick to withstand all types of traffic and come with facing materials in choice of colors. RubbAir Door.
Circle 110 on reader service card

Thresholds for handicapped people. ¼-in. high, they are said to be the first thresholds under ½-in. in height that can be used with door hinges either offset or centerhung as well as separately. Of extruded aluminum or in architectural bronze, they are designed to couple into 6-, 7-, or 8-in. widths or to be used by themselves in 3- or 4-in. widths. Also offered are five other thresholds 5/16-in. or less in height that can be used in various situations for the handicapped. Pemko Manufacturing Co.
Circle 111 on reader service card

Wall-mounted water cooler. Major features of the barrier-free model include ample headroom and rounded corners, lever handles on both sides allowing either right- or left-hand operation, and easy actuation by persons with limited hand or arm mobility, plus two-stream projector. Compact unit mounts 34–36 in. above the floor and projects 18.5 in. from the wall. Its top is stainless steel with satin finish. Standard cabinet finish is tan. Halsey Taylor.
Circle 112 on reader service card

Swing Clear Hinges. Contrary to conventional hinges which allow doors to extend up to 2 in. into the opening, these hinges eliminate this extension into the opening, permitting easier access for those in wheelchairs. Hinges come in standard and heavy weight for residential, commercial, institutional applications. Stanley Hardware.
Circle 113 on reader service card

Steel literature

The literature mentioned below relates specifically to the technics article on steel beginning on page 104. It is grouped here for the reader's convenience.

'Fire-Resistant Steel Frame Construction.' Table of contents of this brochure includes such topics as building codes, fire tests, fire protection materials and methods, steel at elevated temperatures, its structural properties, and fire-resistance ratings. American Iron and Steel Institute.
Circle 200 on reader service card

'Steel Structures for Mass Transit.' Hard cover book discusses fundamental dynamic concepts as they relate to vehicle-guideway systems, and studies based on three hypothetical vehicles are presented to show various dynamic conditions which might be encountered in an urban vehicle-guideway system. Discussed are design approaches for improving ride quality, construction aspects which affect the design of these structures, and sample designs which are presented for composite steel-concrete guideways. American Iron and Steel Institute.
Circle 201 on reader service card

'The Staggered Truss System—Design considerations.' Based on a company slide presentation, the new brochure touches on such things as building configurations, stacking arrangements, floor systems, floor shear transmittal and truss and column design guidelines. It also summarizes the advantages of staggered truss framing over the portal-frame system and makes observations on the economics and efficiency of the newer system. United States Steel Corporation.
Circle 202 on reader service card

Steel framing. Revised edition of catalog WC-608-R3 covers in detail the various components that comprise the framing system. It also illustrates some steel framing jobs at various stages of construction. All technical data on physical and structural properties, load tables, and curtain wall construction have been up-dated. A complete table on fire ratings is also included. Wheeling-Pittsburgh Steel Corp.
Circle 203 on reader service card
[continued on page 132]

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With ACRYLITE® SDP* double skinned acrylic sheet, it's open and shut.

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Literature continued from page 130

Structural steel shapes and plates. The shapes described in catalog are available in a variety of steels, including the high-strength low-alloy steels and weathering steels. Specific data are included in chart form. Armco Steel Corp.
Circle 204 on reader service card

'Contemporary Structures.' Reference booklet contains illustrations of many steel structures, from high-rise office buildings to industrial buildings to residences. American Iron and Steel Institute.
Circle 205 on reader service card

'A design Guide: Long Span Steel Roof Structures.' 60-pages of information on this subject includes design and structural criteria, structural characteristics, and illustrations and data about the various systems in use. American Iron and Steel Institute.
Circle 206 on reader service card

Steel doors. Eight-page, full-color brochure describes fire-rated, urethane insulated all-steel doors with many design features, including Universal Hardware Adapter System that adapts door to accommodate a variety of deadbolt/passage lock centerline distances, reversability for right or left swing, and mortised hinge locations for clean-line hinge placement. Precision Building Products.
Circle 207 on reader service card

'Installation of Steel Door Frames in Steel Stud-Gypsum Board Fire Rated Partitions' contains 11 explanatory sketches, gives construction details for both single unit door frames and three unit slip-on door frames. The Gypsum Association.
Circle 208 on reader service card

W12 column sections. An engineering study featuring W12 column sections of 190 through 336 lb/in ft includes economic comparisons with W14 sections conducted for both industrial and commercial high-rise buildings. Armco Steel Corporation.
Circle 209 on reader service card

Steel decks. Three revised catalogs include a 16-page two-color catalog which features the advantages of using steel roof decks in building construction and includes up-dated and revised technical data and specifications; an eight-page bulletin which contains all pertinent data on floor decks; and a 20-page two-color catalog which covers floor decks in detail. Wheeling-Pittsburgh Steel Corporation.
Circle 210 on reader service card

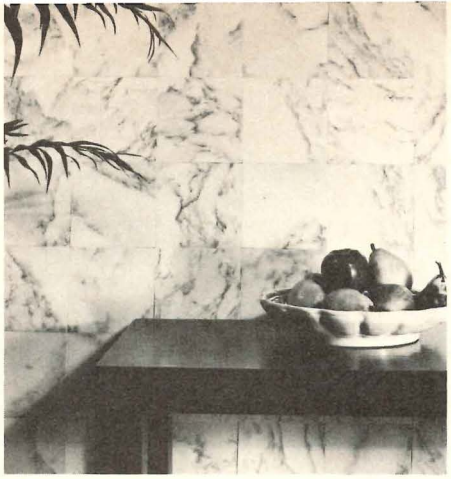
Side-hinged steel doors. 32-page bulletin features a wide spectrum of factory-finished steel doors available in 13 colors, with complete data on frame components and operating hardware. Included is a selection chart covering door sizes, special conditions, label requirements, and door recommendations. Also included is a builders' hardware selection guide and detailed information on steel frame design and application for different types of construction, UL and FM labeled fire doors, hanging and locking the door, and steel door performance and conformance specifications. Data are provided on all basic steel door designs. The Ceco Corp.
Circle 211 on reader service card

'High-strength bolting for structural joints.' Topics covered in brochure include history, theory, and practice, installation procedures, and reference tables that can help provide a working knowledge of the proper use of high-strength bolts for structural application. Bethlehem Steel.
Circle 212 on reader service card

Other literature

Glass door hardware. Brochure illustrates and describes hardware for swinging and sliding doors. Product guide gives function and application of each product. Adams Rite Manufacturing Co.
Circle 213 on reader service card

Thermax™ Sheathing. Color brochure describes insulation board that consists of a glass-reinforced polyisocyanurate foam plastic core with aluminum foil facers. It discusses its properties and uses for saving energy. The Celotex Corporation.
Circle 214 on reader service card



Marble tile

Showers

Marble tile. Italian marble is available in a new 6″ x 6″ x ¼″ size in a wide range of natural colors. Available to architects and designers is a large portfolio containing ten actual samples of the marble in the various stock colors, together with various product information folders. Bufalini Marble Corporation.
Circle 215 on reader service card

Showers. Newest addition to company's line of message hand showers offers four spray settings. It comes in a number of different models and with necessary accessories to fit any bathroom installation. Color catalog illustrates various models. Ondine.
Circle 216 on reader service card

Grilles/panels/doors. Comprehensive 100-page color catalog profusely illustrates company's extensive line of carved wood products. Standard hardwoods are walnut, ash, maple, red oak, sycamore and poplar; other woods such as birch, pecan, and cherry are available to order as are a wide variety of imported exotic hardwoods including mahogany, rosewood, and teak, to name a few. Products come in a wide choice of standard and custom finishes. Customwood.
Circle 217 on reader service card

Slate. Brochures illustrate buildings that have used slate for panels, roofing, and flooring and flagging, give product information and show floor details. Buckingham-Virginia Slate Corp.
Circle 218 on reader service card

Concrete/polystyrene roof deck system offering a 2-hr fire rating is covered in new catalog. Publication includes application of perlite concrete roof decks, physical property data, weight comparisons with other materials as well as "U" values. Six different roof deck designs with fire resistive ratings up to 3 hrs are detailed. A guide specification is included. Perlite Institute, Inc.
Circle 219 on reader service card

Multi-Ped. A utility component pedestal that is capable of housing six services: gas, water, and electric meters; telephone fused terminal post connectors; cable TV; and a box for mail and packages including mail slot and address plate. It has the capabilities for telemetering. Utility Component Pedestal Corporation.
Circle 220 on reader service card

Medical products. 12-page bulletin D-4K contains information and specifications on general care walls, patient consoles, bed bumpers, and neonatal consoles. Included in each description are typical architects' specifications and a discussion of available options. Square D Co.
Circle 221 on reader service card

Fire-retardant treated timber is described in brochure. Such wood may be used in both exterior and interior applications for siding and paneling, soffit and fascia, shakes and shingles, or balconies, railings, and walkways. Koppers Company, Inc.
Circle 222 on reader service card

Building materials

Major materials suppliers for buildings that are featured this month, as they were furnished to P/A by the architects.

Joseph E. Cole Recreation Center, Washington, DC (p. 72). *Architects: The Kent Cooper Partnership (now The Cooper-Lecky Partnership), Washington, DC.* Concrete foundation: W.R. Grace Co. Reinforcing steel: Montague Betts. Steel frame columns and beams: Columbia Welders & Ironworks. Brick masonry: Cushwa. Mortar: Riverton Corp. Concrete: Grace & Buffalo. Metal space frame: Unistrut Corp. Steel joists: Guille Steel Products. Skylights: Wasco. Concrete Masonry Units: Robinson Block Co. Brick pavers: Taylor Clay. Vinyl asbestos tile: GAF. Carpet: General Felt Industries. Urethane compound: McNaughton Brooks. Acoustic tile: Armstrong. Ceiling frame: Eastern. Built-up roof: Celotex. Asbestos board siding: Johns-Manville: Waterproofing and dampproofing: Robson Co. Rigid insulation: Barrett Roofing. Perimeter insulation: U.S. Mineral. Interior drains: Josam. CMU: Robinson Block Co. Folding partitions, curtains: Hough Mfg. Fixed glass, aluminum frame windows: Anaconda. Sliding, aluminum frame windows: Alenco. Steel frame windows: Hope's. Metal doors: Superior Fireproof. Automatic glass doors: Blanchard. Security gates: North American Doors. Locksets: Best, Falcon. Door closers: Reading. Hinges: McKinney. Panic exit: REI. Push/Pull bars: Bobrick. Interior flat latex paint: Duron. Interior epoxy wall coatings: Glidden. Kitchen appliances: Marvel, Westinghouse. Kitchen cabinets: Arlington Millwork. Swimming pool: Sylvan. Chalk and tack boards: Modern School Equipment. Lockers: Steel Products Co. Pathway lights: Lightolier. Gym lights: Widelight. Miscellaneous interior lights: Prescolite, Kurt Versen. Indirect lighting: LAM. Plumbing and sanitary: Kohler. Partitions: Sanymetal. Unit ventilators, chillers and heaters: Trane. Controls: Johnson Controls. Boiler: Kewanee.

Illinois Regional Library for the Blind and Physically Handicapped, The Chicago Public Library, Chicago, Il (p. 76). *Architect: Stanley Tigerman & Associates in association with the Bureau of Architecture, City of Chicago.* Concrete foundations: Material Service Corp. Reinforcing bars: Ceco Corp. Steel frame: Auburn Iron Works, Inc. Concrete and steel panels: Bloomer Fisk Inc. Precast concrete plank floors: Midwest Concrete Products. Gypsum board walls: U.S. Gypsum. Asphalt dampproofing: Emulsified Asphalts, Inc. Sprayed fiber insulation: Air-O-Therm Co. Clear tempered glass: Tyler & Hippach Glass Co. Silicone butt joints: General Electric. Hollow metal doors: Superior Fireproof Door and Sash Co. Flush metal panel overhead doors: Overhead Door Co. of Indiana. Elevator doors: National Elevator Cab and Door Corp. Revolving doors: Crane Fulview Glass Door Co. Locksets: General Lock Co. Door closers: Sargent and Co. Hinges: The Stanley Works. Panic exits: Sargent and Co. Paints and stains, exterior and interior: Pratt and Lambert. Bookstacks: Estay Corp. Hydraulic elevators: Colley Elevator Co. Parking lot lights: Crouse-Hinds Co. Fluorescent tube lighting: Duray Fluorescent Manufacturing Co. Water closets, lavatories: Kohler. Flush valves: Sloan. Heating and a/c system: Lennox.

House near New York (p. 82). *Architects: Charles Moore, Los Angeles, and Richard B. Oliver, New York.* Concrete block foundation walls. Wood frame. Stud walls. Wood joists. Wood rafters. Cedar clapboard, redwood, gypsum board, and fieldstone walls. Oak strip and oak board flooring. Mexican quarry tile flooring: Elon. Virginia slate roof. French doors and windows: Bailey's Architectural Millwork. Custom hardware: P.E. Guerin. Plumbing: American standard. Tile: Country Floors, Inc., Elon, Inc., and Hastings Tile, Ltd.

Auditorium and Music Building, Kentucky School for the Blind, Louisville, Ky, (p. 86). *Architect: Jasper D. Ward, Louisville, Ky.* Masonry Insulation: Rapcofoam. Metal roof deck: Robertson. Bar joists: Vulcraft. Skylight: Fisher Skylight. Metal doors, frames, acoustic panels: Amweld, Republic Steel, Industrial Acoustic Co., Sonic Bar. Finish hardware: Stanley, Corbin, LCN. Paint: Glidden-Porter. Toilet accessories: Boberick. Bathroom fixtures: American Standard. Theater seating: American Seating. Sinks, Water coolers: Elkay. Air handling units: Air Therm. Return air registers, grilles, diffusers: Titus. Lighting: Presco Lite, Lithonia, Miller, Art Metal, Hub, Dual Lite. Heating: Chromlux.

Notices

New addresses

J. Kelly Murphy III, AIA, Beaver Hill Rd, P.O. Box 71, Birchrunville, Pa 19421.

Kearin & Hume Architects, 322 Main St, Stamford, Ct 06901.

Professional Design Associates Inc., 928 N. Charles St, Baltimore 21201.

Tobocman & Lawrence Architects, 30100 Telegraph, Suite 342, Birmingham, Mi 48010.

Louis Sauer Associates, Architects, 1621 Cypress St, Philadelphia 19103.

Neski Associates/Architects, 8 W. 40 St, New York 10018.

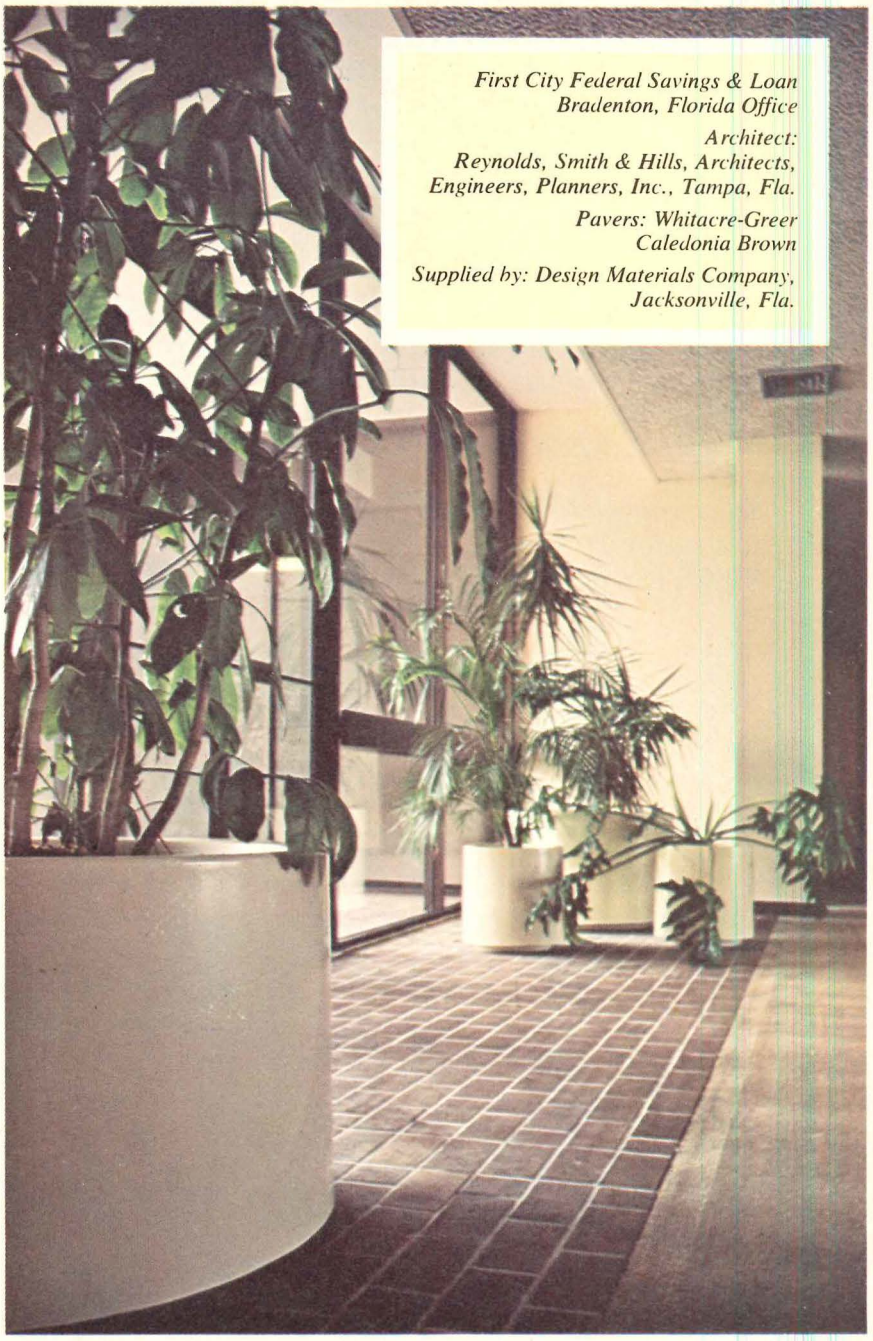
Kaufman Associates, 2405 S. Gessner, Houston 77063.

Bruce Jonothon Geller, Architect and Planner, 236 Highway Nine, Howell, NJ 07731.

FitzGerald Design Associates, Inc., 4702 E. Rancho Dr, Phoenix 85018.

Stanley Tigerman & Associates, Ltd., 920 N. Michigan Ave, Chicago 60611.

[continued on page 136]



First City Federal Savings & Loan
Bradenton, Florida Office

Architect:
Reynolds, Smith & Hills, Architects, Engineers, Planners, Inc., Tampa, Fla.

Pavers: Whitacre-Greer
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Notices continued from page 134

New firms

John H. Woodford, AIA, Architect, 150 Green St., Penthouse B, San Francisco 94111.

F. James Akin/Stuart L. Rothman, AIA/Associated Architects, 10405 Town and Country Way, Suite 404, Houston 77024.

Richard W. Snibbe, FAIA, 77 Irving Pl, New York 10003.

Morton Rader, AIA, 17 Alta St, San Francisco 94133.

Paul E. Martin and **Hossein Oskouie** have formed Urban Architecture, 1775 Saint James Pl, Houston 77056.

Lawrence Atkinson, Architect, 1033 Old S. Gaylord, Denver 80209.

Joel B. Cantor, AIA, Architect, 150 Green St., Penthouse B, San Francisco 94111.

Michael McMillan, AIA has formed McMillan Associates Architects and Consultants, First Federal Building, Suite 502, 301 College St, Greenville, SC 29601.

George Hoover, Karl Berg & Associates, 1535 19th St, Denver 80202.

Joseph D. Hoskins, John J. Scott, Kenneth Taylor, and Herbert Zeller have established **Hoskins Scott Taylor & Partners, Inc.,** 60 State St, Boston 02109.

Lawrence H. Mason and Peter N. da Silva have formed **Mason, da Silva Associates,** 205 Lexington Ave, New York 10016.

Angelo Francis Corva, Architect, 159 Great Neck Rd, Great Neck, NY 11021.

Marie Louise Laleyan, AIA has established **Laleyan Associates,** 414 Mason St., San Francisco 94102.

Charles L. Weaver, Jr., Mark Weglarz, and Charles B. Zucker have formed **Weaver, Weglarz, Zucker,** offering architecture, landscape architecture, planning, and research services. The office is located at 1208 N. Calvert St., Baltimore 21202.

Richard Heglund, Architect, Marinwood Professional Center, 2400 Las Gallinas Ave, San Rafael, Ca 94903.

Paul H. Johnson, Architect, 1463 Willard St., San Francisco 94117.

R. Bruce Simmons has formed **Simmons Associates, Architects,** 7000 Regency Square Blvd., Houston 77036.

Michael Lisec and Carl R. Klimek have formed **Lisec & Klimek, Architects and Planners,** 407 S. Dearborn St., Chicago 60605.

Ronald W. Ford and E. Harley Holmes, Jr. have formed **Ford & Holmes AIA, Architects/Planners,** 7800 Ash, Prairie Village, Ks 66208.

J. Prentiss Browne, Phillip W. Worrall, and Tillman D. Johnson have established **Browne, Worrall & Johnson, Architects,** 123 Cathedral St., Annapolis 21401 and 2435 N. Calvert St., Baltimore 21218.

Sam A. Listi and George W. Outlaw have established **Listi/Outlaw, architects and planners,** 2627 N. Loop West, Houston 77008.

Norbert N. Turkel has formed **The Turkel Collaborative,** 210 E. 52 St., New York 10022.

Thomas L. Carr, Brian L. Daigle, and James R. Hathaway have formed **Carr Daigle Hathaway Architecture Planning,** 7 Parker Pl., 2600 S. Parker Rd., Denver 80232.

Jasper S. Hawkins, Jr., Thomas W. Lindsey, and Harry B. Wilson, Jr. have formed **Hawkins, Lindsey, Wilson Associates,** with offices in Los Angeles and Phoenix.

[continued on page 138]

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Notices continued from page 136

Appointments

Albert A. Dorman has been appointed chief executive officer of Daniel, Mann, Johnson, & Mendenhall, Los Angeles.

John A. Dziuba and **Curt Zeiser** have joined Perkins & Will, Chicago, as director of interiors and vice president in charge of design respectively.

William C. Schenck, AIA has been appointed associate of Coffee & Crier, Architects and Planners, Austin.

Mark Bielski has been named director of architecture for E. Jerome Tamen AIA & Associates, Century City, Ca.

John C. Haro, FAIA has rejoined Albert Kahn Associates, Inc., Detroit, as a vice president and director of planning and architectural design.

Ronald A. Altoon, AIA has been promoted to senior vice president and member of the board of directors of Charles Kober Associates, Los Angeles. **Paul K. Curran, AIA** and **Richard Magee, AIA** have been named to the board of directors.

Joseph G. Weiss has been named a vice president of Peckham-Guyton, Inc., St. Louis.

Kenneth Ritchin, AIA has been appointed director of facility planning for Medicus Systems Corp., Elmsford, NY.

Thomas W. Layman has been promoted to assistant district manager of Grubb & Ellis Company's South Bay, Ca, office.

Thomas Napier has been named an associate of Steven Winter Associates, Architects and Building Consultants, New York and Chicago. The following have joined the staff: **William D. von Vitzthume, John Longo, Rita Marks, Andrew Bachman,** and **James Gainfort.**

Lew Butler has joined Neville Lewis Associates, Inc., New York space planners and interior designers.

John J. Hernikl, AIA and **Edward M. Lee, AIA** have joined Environmental Planning & Research, Inc., San Francisco.

Edward F. Menefee has joined Aeck Associates, Atlanta, as a principal.

Page Southerland Page, Austin, has announced the following new partners: **Richard S. Atmar, William H. Brydson, Acree B. Carlisle, Ernesto G. Liebrecht, Phocion S. Park, Robert E. Tieman, Jay L. Willmann.**

M. Stuart Nimmons and **Joe Barbaria** have joined Planning, Design, Research Corp., Houston.

Caudill Rowlett Scott, Houston, has announced the following appointments: **E. Bruce Appling, PE** and **Joe B. Thomas,** PE, senior vice presidents; **Roylance R. Bird, Jr., AIA** and **Gerald S. Pfeffer, AIA,** vice presidents; **Conny R. Brown, Dennis G. Felix, Nathaniel Firestone, Louis E. Hood, Jim C. Kollaer, James W. McGibney, Charles F. Pock, Jane M. Stansfeld, Edward S. Werth,** and **Howard P. Zweig,** associates.

Dale R. Johnson has been named corporate director of architectural design for Smith, Hinchman & Grylls Associates, Detroit. **Frederick A. Sargent** has been appointed director of interior design services.

Andrew W. Prescott has been named a principal of Einhorn Yaffee Prescott, PC, Albany.

Daniel H. Lare has been named director of landscape architecture for Benham Blair & Affiliates, Oklahoma City.

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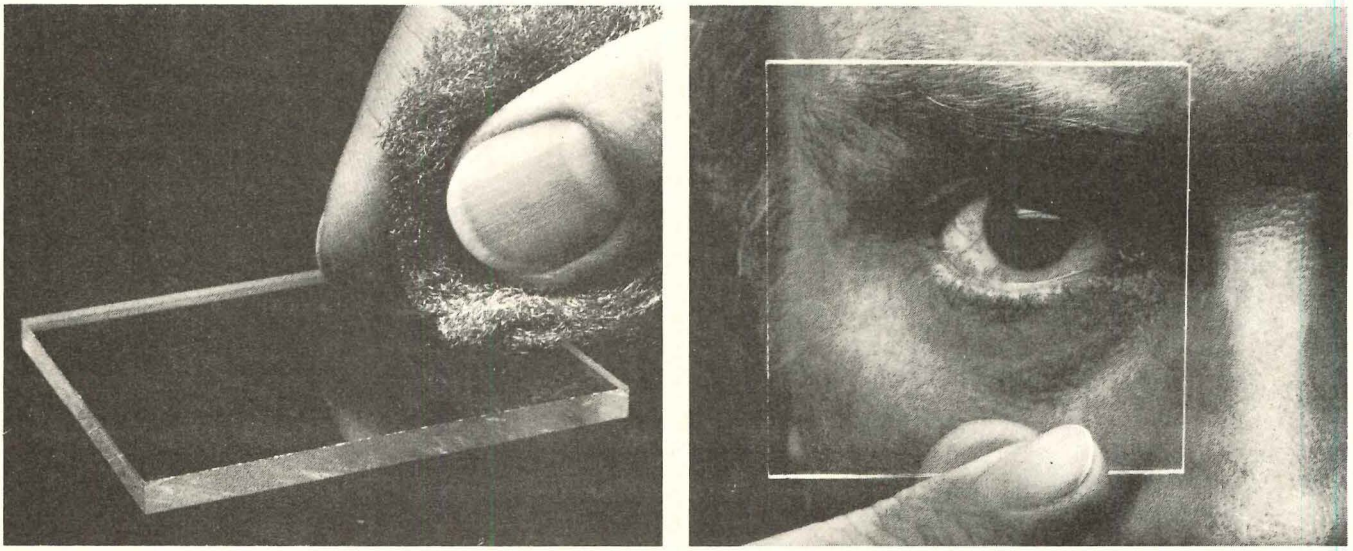

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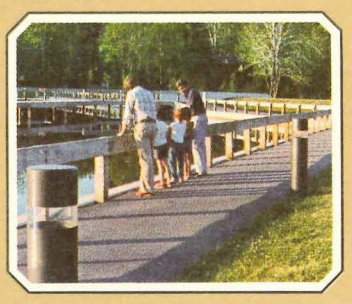

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Chairperson: The Department of Architecture at Cornell University seeks a Chairperson with outstanding qualifications for an appointment beginning August 1, 1978. The Department is part of the College of Architecture, Art and Planning. It offers a 5-year undergraduate professional degree in Architecture, and graduate degrees in architecture, architectural history and preservation, architectural science and landscape architecture. The new Chairperson will represent the interests of faculty, students and staff in the academic and professional communities and will be responsible for guiding the Department's internal affairs in such areas as curriculum, admissions, appointments and general administration. It is important that the Chairperson actively participates in the academic life of the Department through teaching. To apply please send a personal resume indicating qualifications and experience to: Chairperson Search Committee, Department of Architecture, College of Architecture, Art & Planning, Sibley Hall, Cornell University, Ithaca, NY 14853. Applications should be received no later than May 1, 1978. Cornell University is an equal opportunity/affirmative action employer.

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Faculty Position in Architectural Technology: Indiana University–Purdue University at Fort Wayne, Construction Technology Department has a full-time teaching position beginning August, 1978. Position involves teaching in Architectural Technology with secondary area in Civil Engineering Technology or Construction Technology. Applicant should have Master's degree in Architecture or related field. Professional experience required, teaching experience helpful. This is a 10-month position as assistant professor. Salary $15,000. Apply to Harry F. Kaufman, Chairman, Construction Technology Department, Indiana University–Purdue University, 2101 Coliseum Blvd., East, Fort Wayne, In 46805. An equal opportunity/affirmative action employer.

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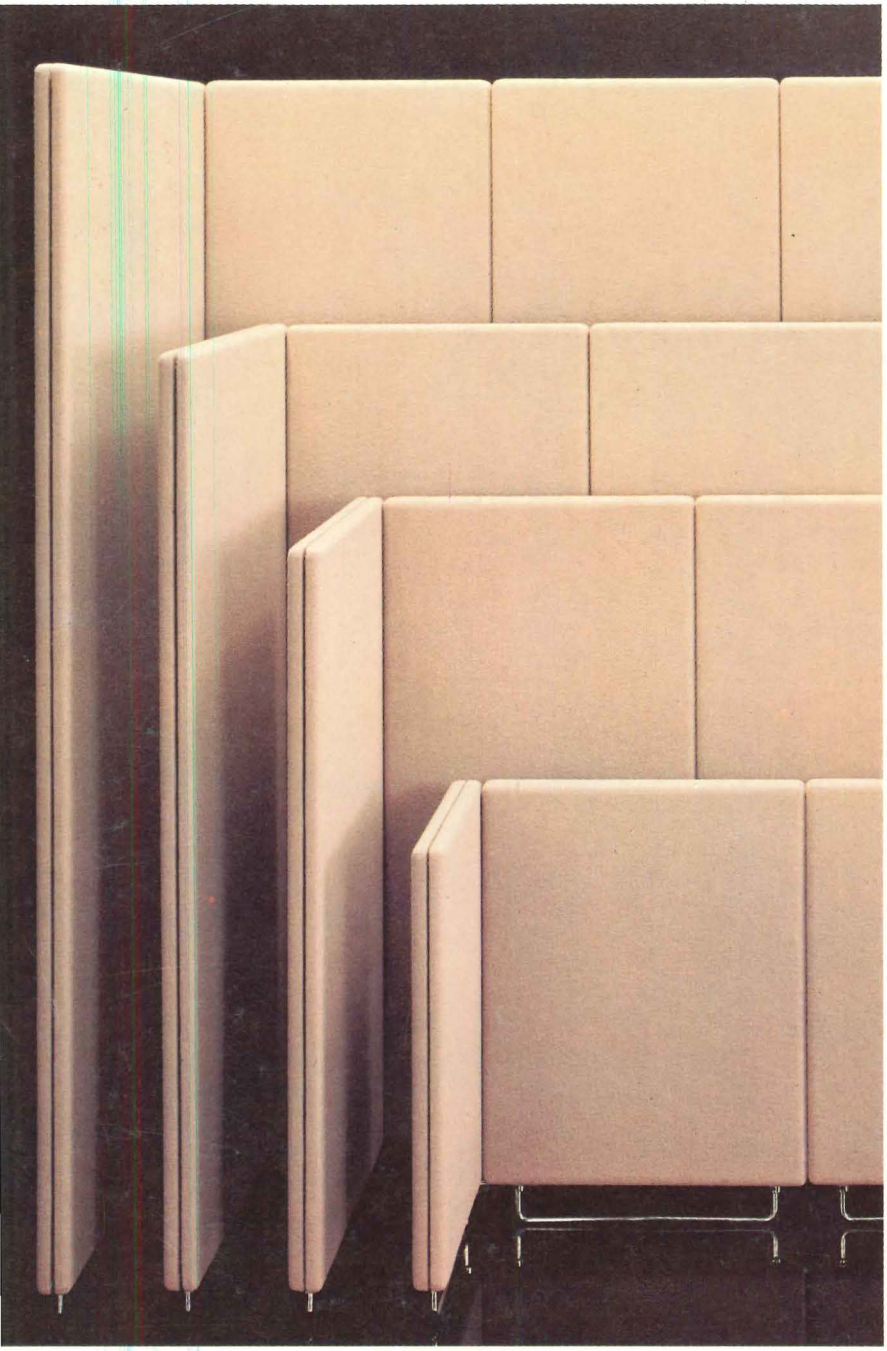

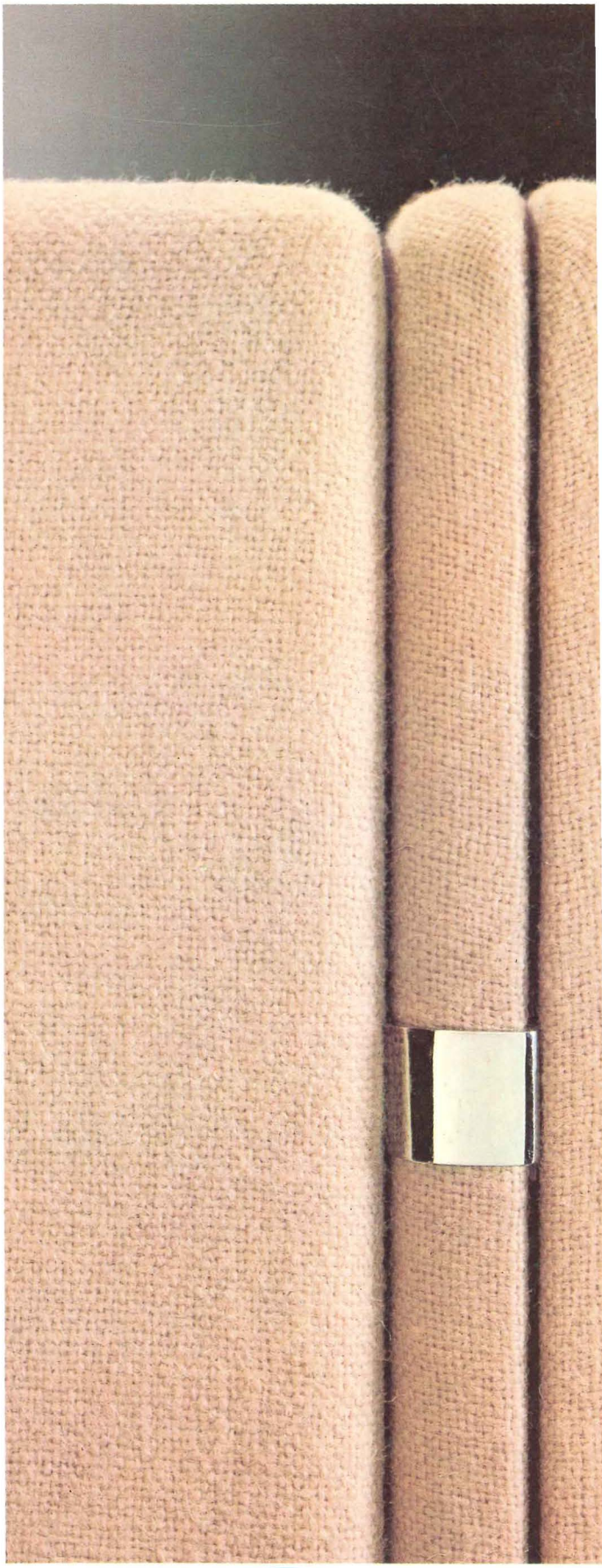

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